Astounding

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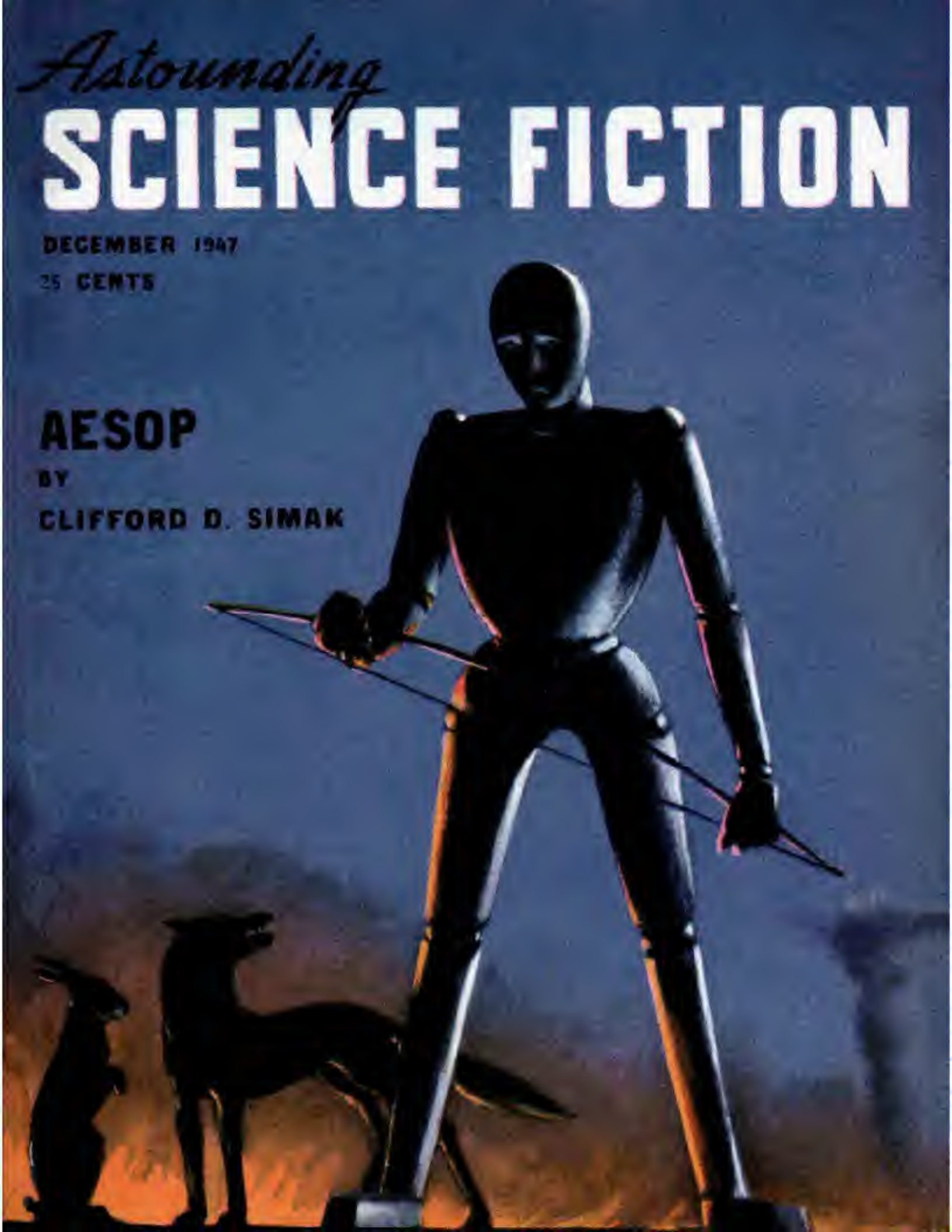
AESOP

BY

CLIFFORD D. SIMAK



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NOTHING WITH A NAME

With the aid of the publicity attendant on the Air Force's show at Hiroshima and Nagasaki, the Navy's display at Bikini, and frantic efforts at public education subsequent to them, people have been made rather generally aware of the existence of something called an "atom." Even "neutrons" are practically common knowledge. Among the science-fiction fraternity, the proton, electron, positron, neutron and even the negatron are fairly well established. But one highly important atomic particle remains almost 100% ignored; the neutrino.

When originally introduced into the lexicon of atomic physics, it was viewed with deep suspicion; it was accused of being a "mathematical bugger factor" * introduced in desperation to account for poor results due to inadequate understanding. The reason for the suspicion is understandable. When first theorized, the neutrino was supposed to be a particle of mass not greater than that of the electron, but having no charge. With so slight a mass, and no charge, the particle would have no influence on atomic nuclei or electrons it might happen to pass, and hence would cause no ionization nor would it be appreciably impeded by matter in its path. The resultant enormous penetrative power would mean that it was impossible to detect its passage. It sounded suspiciously like something designed by its inventor to make possible the reply to a challenger, "well, I know I can't show you one—but you can't prove it isn't there; even if it is there you can't detect it." But it would be an answer to an old question if it existed—

When a radioactive atom fires out an alpha particle, the particle comes out with a definite energy; the nucleus that emitted it had a certain excess of energy to unload, and the alpha particle carries it away. When a proton is fired out of a nucleus, that, too, has a definite, predictable energy, representing the change in the nuclear energy of the emitting atom. But—when a nucleus emits a beta particle—an electron—there's a different story. There is a definite amount of energy released by the

* "Bugger factor" has been described as "that factor which, when added to, subtracted from, multiplied by or divided into the wrong answer gives the right answer." Any adjusting screw, potentiometer, or the like constitutes an engineering equivalent—and is very useful. The suspicion remains that such "bugger factors" are required only because of imperfect workmanship or design.

nucleus; that's readily provable. When helium-6 decays by beta emission to lithium-6, it emits an electron which may have a maximum of 3.7 M.E.V. energy. The nucleus has that much energy to unlead. But the electron may come out with only a few hundred volts energy instead of several million; most of the electrons escaping actually show about 1.8 M.E.V. energy. Something must have happened to the rest of that energy. No other particle is detected escaping. There is no gamma ray emission to carry away the excess energy—

It is something like a man who gets on the subway at one station, with $50 securely buttoned in his pocket, and gets off at the next minus fifty bucks. Now he hasn't seen any hand escaping with that money; he has no visible, demonstrable evidence that there was a pickpocket around. But it's extremely probable that some thief he didn't see collected that cash. Of course, it's *possible* for the statistical laws of thermal energy to have come up with the high-order improbability that caused the cellulose of the bill's structure to evaporate. Possibly some particular lurch or twist he made somehow maneuvered it, and it alone, into the fourth dimension. But I'd look for some unseen thief—

The physicists looked for a neutrino, the unseen thief of energy. Unfortunately the neutrino is an excessively slippery customer. They've made experiments at the atomic piles seeking to find neutrinos—and the piles produce stupendous quantities of 'em. No instrument, no matter how carefully designed, even gets a whisper of 'em. They pass unopposed through anything and everything; since they encounter no opposition, there's no reaction on the instruments.

It's interesting that, since they can leak through any shielding, through thousands or even hundreds of thousands of miles of solid rock, you are at this instant being shot through and through by neutrinos escaping from the great piles at Hanford, at Oak Ridge, Chalk River, at Los Alamos and at Chicago. Power—power in the tens of thousands of horsepower—escapes continuously, unimpeded, from every atomic furnace. The neutrinos escaping from the piles equal, very nearly, the number of beta-ray emissions taking place in the pile—and that is a terrific number.

Neutrinos, though, are evidently harmless. We'd have been destroyed long ere this if they weren't—for they escape just as readily, just as unopposed, from the deep interior of the Sun.

Problem: To design an instrument that can detect neutrinos. Do that and you'll soon have a device which will point out any atomic engine in operation, or that has been in operation, no matter how shielded and protected. The whole bulk of the Earth would be no concealment at all for an unauthorized or unlisted atomic pile.

The U.N. could certainly use such a device!

THE EDITOR.

The old robot had made a better world of it than Man had. But there was still the problem of the Websters—who were curious, and their curiosity was deadly, its end predictable. But there was a solution—

AESOP

BY CLIFFORD D. SIMAK

Illustrated by Cartier

The gray shadow slid along the rocky ledge, heading for the den, mewing to itself in frustration and bitter disappointment—for the Words had failed.

The slanting sun of early afternoon picked out a face and head and body, indistinct and murky, like a haze of morning mist rising from a gully.

Suddenly the ledge pinched off and the shadow stopped, bewildered, crouched against the rocky wall—for there was no den. The ledge pinched off before it reached the den!

It whirled around like a snapping whip, stared back across the valley. And the river was all wrong. It flowed closer to the bluffs than it had flowed before. There was a swallow's nest on the rocky wall and there'd never been a swallow's nest before.

The shadow stiffened and the tufted tentacles upon its ears came up and searched the air.

There was life! The scent of it lay faint upon the air, the feel of it vibrated across the empty notches of the marching hills.

The shadow stirred, came out of its crouch, flowed along the ledge.

There was no den and the river was different and there was a swallow's nest plastered on the cliff.

The shadow quivered, drooling mentally.

The Words had been right. They had not failed. This was a different world.

A different world—different in more ways than one. A world so full of life that it hummed in the very air. Life, perhaps, that could not run so fast nor hide so well.

The wolf and bear met beneath the great oak tree and stopped to pass the time of day.

"I hear," said Lupus, "there's been killing going on."

Bruin grunted. "A funny kind of killing, brother. Dead, but not eaten."

"Symbolic killing," said the wolf.

Bruin shook his head. "You can't tell me there's such a thing as symbolic killing. This new psychology the Dogs are teaching us is going just a bit too far. When there's killing going on, it's for either hate or hunger. You wouldn't catch me killing something that I didn't eat."

He hurried to put matters straight. "Not that I'm doing any killing, brother. You know that."

"Of course not," said the wolf.

Bruin closed his small eyes lazily, opened them and blinked. "Not, you understand, that I don't turn over a rock once in a while and lap up an ant or two."

"I don't believe the Dogs would consider that killing," Lupus told him, gravely. "Insects are a little different than animals and birds. No one has ever told us we can't kill insect life."

"That's where you're wrong," said Bruin. "The Canons say so very distinctly. You must not destroy life. You must not take another's life."

"Yes, I guess they do," the wolf admitted sanctimoniously. "I guess you're right, at that, brother. But even the Dogs aren't too fussy about a thing like insects. Why, you know, they're trying all the time to make a better flea powder. And what's flea powder for, I ask you? Why, to kill fleas. That's what it's for. And fleas are life. Fleas are living things."

Bruin slapped viciously at a small green fly buzzing past his nose.

"I'm going down to the feeding station," said the wolf. "Maybe you would like to join me."

"I don't feel hungry," said the bear. "And, besides, you're a bit too early. Ain't time for feeding yet."

Lupus ran his tongue around his muzzle. "Sometimes I just drift in, casuallike you know, and the Webster that's in charge gives me something extra."

"Want to watch out," said Bruin. "He isn't giving you something extra for nothing. He's got something up his sleeve. I don't trust them Websters."

"This one's all right," the wolf declared. "He runs the feeding station and he doesn't have to. Any robot could do it. But he went and asked for the job. Got tired of

lolling around in them foxed-up houses, with nothing to do but play. And he sits around and laughs and talks, just like he was one of us. That Peter is a good Joe."

The bear rumbled in his throat. "One of the Dogs was telling me that Jenkins claims Webster ain't their name at all. Says they aren't Websters. Says that they are men—"

"What's men?" asked Lupus.

"Why, I was just telling you. It's what Jenkins says—"

"Jenkins," declared Lupus, "is getting so old he's all twisted up. Too much to remember. Must be all of a thousand years."

"Seven thousand," said the bear. "The Dogs are figuring on having a big birthday party for him. They're fixing up a new body for him for a gift. The old one he's got is wearing out—in the repair shop every month or two."

The bear wagged his head sagely. "All in all, Lupus, the Dogs have done a lot for us. Setting up feeding stations and sending out medical robots and everything. Why, only last year I had a raging toothache—"

The wolf interrupted. "But those feeding stations might be better. They claim that yeast is just the same as meat, has the same food value and everything. But it don't taste like meat—"

"How do you know?" asked Bruin.

The wolf's stutter lasted one split second. "Why . . . why, from what my granddad told me. Regular old hellion, my granddad. He had him some venison every now and then. Told me how red meat tasted. But then they didn't have so many wardens as they have nowadays."

Bruin closed his eyes, opened them again. "I been wondering how fish taste," he said. "There's a bunch of trout down in Pine Tree creek. Been watching them. Easy to reach down with my paw and scoop me out a couple."

He added hastily. "Of course, I never have."

"Of course not," said the wolf.

One world and then another, running like a chain. One world treading on the heels of another world that plodded just ahead. One world's tomorrow another world's today. And yesterday is tomorrow and tomorrow is the past.

Except, there wasn't any past. No past, that was; except the figment of remembrance that fitted like a night-winged thing in the shadow of one's mind. No past that one could reach. No pictures painted on the wall of time. No film that one could run backward and see what-once-had-been.

Joshua got up and shook himself, sat down and scratched a flea. Ichabod sat stiffly at the table, metal fingers tapping.

"It checks," the robot said. "There's nothing we can do about it. The factors check. We can't travel in the past."

"No," said Joshua.

"But," said Ichabod, "we know where the cobblies are."

"Yes," said Joshua, "we know

where the cobblies are. And maybe we can reach them. Now we know the road to take."

One road was open, but another road was closed. Not closed, of course, for it had never been. For there wasn't any past, there never had been any, there wasn't room for one. Where there should have been a past there was another world.

Like two dogs walking in one another's tracks. One dog steps out and another dog steps in. Like a long, endless row of ball bearings running down a groove, almost touching, but not quite. Like the links of an endless chain running on a wheel with a billion billion sprockets.

"We're late," said Ichabod, glancing at the clock. "We should be getting ready to go to Jenkins' party."

Joshua shook himself again. "Yes, I suppose we should. It's a great day for Jenkins, Ichabod. Think of it . . . seven thousand years."

"I'm all fixed up," Ichabod said, proudly. "I shined myself this morning, but you need a combing. You've got all tangled up."

"Seven thousand years," said Joshua. "I wouldn't want to live that long."

Seven thousand years and seven thousand worlds stepping in one another's tracks. Although it would be more than that. A world a day. Three hundred sixty-five times seven thousand. Or maybe a world a minute. Or maybe even one world every second. A second was a thick thing—thick enough to separate two worlds, large enough to hold two worlds. Three hundred sixty-five times seven thousand times twenty-four times sixty times sixty—

A thick thing and a final thing. For there was no past. There was no going back. No going back to find out about the things that Jenkins talked about—the things that might be truth or twisted memory warped by seven thousand years. No going back to check up on the cloudy legends that told about a house and a family of Websters and a closed dome of nothingness that squatted in the mountains far across the sea.

Ichabod advanced upon him with a comb and brush and Joshua winced away.

"Ah, shucks," said Ichabod, "I won't hurt you any."

"Last time," said Joshua, "you darn near skinned me alive. Go easy on those snags."

The wolf had come in, hoping for a between-meals snack, but it hadn't been forthcoming and he was too polite to ask. So now he sat, bushy tail tucked neatly around his feet, watching Peter work with the knife upon the slender wand.

Fatso, the squirrel, dropped from the limb of an overhanging tree, lit on Peter's shoulder.

"What you got?" he asked.

"A throwing stick," said Peter.

"You can throw any stick you want to," said the wolf. "You don't need a fancy one to throw.

You can pick up just any stick and throw it."

"This is something new," said Peter. "Something I thought up. Something that I made. But I don't know what it is."

"It hasn't got a name?" asked Fatso.

"Not yet," said Peter. "I'll have to think one up."

"But," persisted the wolf, "you can throw a stick. You can throw any stick you want to."

"Not as far," said Peter. "Not as hard."

Peter twirled the wand between his fingers, feeling the smooth roundness of it, lifted it and sighted along it to make sure that it was straight.

"I don't throw it with my arm," said Peter. "I throw it with another stick and a cord."

He reached out and picked up the thing that leaned against the tree trunk.

"What I can't figure out," said Fatso, "is what you want to throw a stick for."

"I don't know," said Peter. "It is kind of fun."

"You Websters," said the wolf, severely, "are funny animals. Sometimes I wonder if you have good sense."

"You can hit any place you aim at," said Peter, "if your throwing stick is straight and your cord is good. You can't just pick up any piece of wood. You have to look and look—"

"Show me," said Fatso.

"Like this," said Peter, lifting up the shaft of hickory. "It's tough, you see. Springy. Bend it and it snaps back into shape again. I tied the two ends together with a cord and I put the throwing stick like this, one end against the string and then pull back—"

"You said you could hit anything you wanted to," said the wolf. "Go ahead and show us."

"What shall I hit?" asked Peter. "You pick it out and—"

Fatso pointed excitedly. "That robin, sitting in the tree."

Swiftly Peter lifted his hands, the cord came back and the shaft to which the cord was tied bent into an arc. The throwing stick whistled in the air. The robin toppled from the branch in a shower of flying feathers. He hit the ground with a soft, dull thud and lay there on his back—tiny, helpless, clenched claws pointing at the treetops. Blood ran out of his beak to stain the leaf beneath his head.

Fatso stiffened on Peter's shoulders and the wolf was on his feet. And there was a quietness, the quietness of unstirring leaf, of floating clouds against the blue of noon.

Horror slurred Fatso's words "You killed him! He's dead! You killed him!"

Peter protested, numb with dread. "I didn't know. I never tried to hit anything alive before. I just threw the stick at marks—"

"But you killed him. And you should never kill."

"I know," said Peter. "I know you never should. But you told

me to hit him. You showed him to me. You—"

"I never meant for you to kill him," Fatso screamed. "I just thought you'd touch him up. Scare him. He was so fat and sassy—"

"I told you the stick went hard."

The Webster stood rooted to the ground.

Far and hard, he thought. *Far and hard—and fast.*

"Take it easy, pal," said the wolf's soft voice. "We know you didn't mean to. It's just among us three. We'll never say a word."

Fatso leaped from Peter's shoulder, screamed at them from the branch above. "I will," he shrieked. "I'm going to tell Jenkins."

The wolf snarled at him with a sudden, red-eyed rage. "You dirty little squealer. You lousy tattletale."

"I will so," yelled Fatso. "You just wait and see. I'm going to tell Jenkins."

He flickered up the tree and ran along a branch, leaped to another tree.

The wolf moved swiftly.

"Wait," said Peter, sharply.

"He can't go in the trees all the way," the wolf said, swiftly. "He'll have to come down to the ground to get across the meadow. You don't need to worry."

"No," said Peter. "No more killings. One killing is enough."

"He will tell, you know."

Peter nodded. "Yes, I'm sure he will."

"I could stop him telling."

"Someone would see you and tell on you," said Peter. "No, Lupus, I won't let you do it."

"Then you better take it on the lam," said Lupus. "I know a place where you could hide. They'd never find you, not in a thousand years."

"I couldn't get away with it," said Peter. "There are eyes watching in the woods. Too many eyes. They'd tell where I had gone. The day is gone when anyone can hide."

"I guess you're right," the wolf said slowly. "Yes, I guess you're right."

He wheeled around and stared at the fallen robin.

"What you say we get rid of the evidence?" he asked.

"The evidence—"

"Why, sure—" The wolf paced forward swiftly, lowered his head. There was a crunching sound. Lupus licked his chops and sat down, wrapped his tail around his feet.

"You and I could get along," he said. "Yes, sir, I have the feeling we could get along. We're so very much alike."

A telltale feather fluttered on his nose.

The body was a lulu.

A sledge hammer couldn't dent it and it would never rust. And it had more gadgets than you could shake a stick at.

It was Jenkins' birthday gift. The line of engraving on the chest said so very neatly:

To Jenkins from the Dogs.

But I'll never wear it, Jenkins told himself. It's too fancy for me,

too fancy for a robot that's as old as I am. I'd feel out of place in a gaudy thing like that.

He rocked slowly back and forth in the rocking chair, listening to the whimper of the wind in the eaves.

They meant well. And I wouldn't *hurt them for the world.* I'll have to wear it once in a while just for the looks of things. Just to please the Dogs. Wouldn't be right for me not to wear it when they went to so much trouble to get it made for me. But not for every day. —just for my very best.

Maybe to the Webster picnic. Would want to look my very best when I go to the picnic. It's a great affair. A time when all the Websters in the world, all the Websters left alive, get together. And they want me with them. Ah, yes, they always want me with them. For I am a Webster robot. Yes, sir, always was and always will be.

He let his head sink and mumbled words that whispered in the room. Words that he and the room remembered. Words from long ago.

A rocker squeaked and the sound was one with the time-stained room. One with the wind along the eaves and the mumble of the chimney's throat.

Fire, thought Jenkins. It's been a long time since we've had a fire. Men used to like a fire. They used to like to sit in front of it and look into it and build pictures in the flames. And dream—

But the dreams of men, said Jenkins, talking to himself—the dreams of men are gone. They've gone to Jupiter and they're buried at Geneva and they sprout again, very feebly, in the Websters of today.

The past, he said. The past is too much with me. And the past has made me useless. I have too much to remember—so much to *remember that it becomes more important* than the things there are to do. I'm living in the past and that is no way to live.

For Joshua says there is no past and Joshua should know. Of all the Dogs, he's the one to know. For he tried hard enough to find a past to travel in, to travel back in time and check up on the things I told him. He thinks my mind is failing and that I spin old robot tales, half-truth, half-fantasy, touched up for the telling.

He wouldn't admit it for the world, but that's what the rascal thinks. He doesn't think I know it, but I do.

He can't fool me, said Jenkins, chuckling to himself. None of them can fool me. I know them from the ground up—I know what makes them tick. I helped Bruce Webster with the first of them. I heard the first word that any of them said. And if they've forgotten, I haven't —not a look or word or gesture.

Maybe it's only natural that they should forget. They have done great things. I have let them do them with little interference, and that was for the best. That was the way Jon Webster told me it should be, on that night of long ago. That was why Jon Webster did whatever he had to do to close off the city of Geneva. For it was Jon Webster.

It had to be he. It could be no one else.

He thought he was sealing off the human race to leave the earth clear for the Dogs. But he forgot one thing. Oh, yes, said Jenkins, he forgot one thing. He forgot his own son and the little band of bow and arrow faddists who had gone out that morning to play at being cavemen—and cavewomen, too.

And what they played, thought Jenkins, became a bitter fact. A fact for almost a thousand years. A fact until we found them and brought them home again. Back to the Webster House, back to where the whole thing started.

Jenkins folded his hands in his lap and bent his head and rocked slowly to and fro. The rocker creaked and the wind raced in the eaves and a window rattled. The fireplace talked with its sooty throat, talked of other days and other folks, of other winds that blew from out the west.

The past, thought Jenkins. It is a footless thing. A foolish thing when there is so much to do. So many problems that the Dogs have yet to meet.

Overpopulation, for example. That's the thing we've thought about and talked about too long. Too many rabbits because no wolf or fox may kill them. Too many deer because the mountain lions and the wolves must eat no venison. Too many skunks, too many mice, too many wildcats. Too many squirrels, too many porcupines, too many bear.

Forbid the one great check of killing and you have too many lives. Control disease and succor injury with quick-moving robot medical

technicians and another check is gone.

Man took care of that, said Jenkins. Yes, men took care of that. Men killed anything that stood within their path—other men as well as animals.

Man never thought of one great animal society, never dreamed of skunk and coon and bear going down the road of life together, planning with one another, helping one another—setting aside all natural differences.

But the Dogs had. And the Dogs had done it.

Like a Br'er Rabbit story, thought Jenkins. Like the childhood fantasy of a long gone age. Like the story in the Good Book about the Lion and the Lamb lying down together. Like a Walt Disney cartoon except that the cartoon never had rung true, for it was based on the philosophy of mankind.

The door creaked open and feet were on the floor. Jenkins shifted in his chair.

"Hello, Joshua," he said. "Hello, Ichabod. Don't you please come in? I was just sitting here and thinking."

"We were passing by," said Joshua, "and we saw a light."

"I was thinking about the lights," said Jenkins, nodding soberly. "I was thinking about the night five thousand years ago. Jon Webster had come out from Geneva, the first man to come here for many hundred years. And he was upstairs in bed and all the Dogs were sleeping and I stood there by the window looking out across the river. And there were no lights. No lights at all. Just one great sweep of darkness. And I stood there, remembering the day when there had been lights and wondering if there ever would be lights again."

"There are lights now," said Joshua, speaking very softly. "There are lights all over the world tonight. Even in the caves and dens."

"Yes, I know," said Jenkins. "It's even better than it was before."

Ichabod clumped across the floor to the shining robot body standing in the corner, reached out one hand and stroked the metal hide, almost tenderly.

"It was very nice of the Dogs," said Jenkins, "to give me the body. But they shouldn't have. With a little patching here and there, the old one's good enough."

"It was because we love you," Joshua told him. "It was the smallest thing the Dogs could do. We have tried to do other things for you, but you'd never let us do them. We wish that you would let us build you a new house, brand new, with all the latest things."

Jenkins shook his head. "It wouldn't be any use, because I couldn't live there. You see, this place is home. It has always been my home. Keep it patched up like my body and I'll be happy in it."

"But you're all alone."

"No, I'm not," said Jenkins. "The house is simply crowded."

"Crowded?" asked Joshua.

"People that I used to know," said Jenkins.

"Gosh," said Ichabod, "what a

body! I wish I could try it on."

"Ichabod!" yelled Joshua. "You come back here. Keep your hands off that body—"

"Let the youngster go," said Jenkins. "If he comes over here some time when I'm not busy—"

"No," said Joshua.

A branch scraped against the eave and tapped with tiny fingers along the window pane. A shingle rattled and the wind marched across the roof with tripping, dancing feet.

"I'm glad you stopped by," said Jenkins. "I want to talk to you."

He rocked back and forth and one of the rockers creaked.

"I won't last forever," Jenkins said. "Seven thousand years is longer than I had a right to expect to hang together."

"With the new body," said Joshua, "you'll be good for three times seven thousand more."

Jenkins shook his head. "It's not the body I'm thinking of. It's the brain. It's mechanical, you see. It was made well, made to last a long time, but not to last forever. Sometime something will go wrong and the brain will quit."

The rocker creaked in the silent room.

"That will be death," said Jenkins. "That will be the end of me."

"And that's all right. That's the way it should be. For I'm no longer any use. Once there was a time when I was needed."

"We will always need you," Joshua said softly. "We couldn't get along without you."

But Jenkins went on, as if he had not heard him.

"I want to tell you about the Websters. I want to talk about them. I want you to understand."

"I will try to understand," said Joshua.

"You Dogs call them Websters and that's all right," said Jenkins. It doesn't matter what you call them, just so you know what they are."

"Sometimes," said Joshua, "you call them men and sometimes you call them Websters. I don't understand."

"They were men," said Jenkins, "and they ruled the earth. There was one family of them that went by the name of Webster. And they were the ones who did this great thing for you."

"What great thing?"

Jenkins hitched the chair around and held it steady.

"I am forgetful," he mumbled. "I forget so easily. And I get mixed up."

"You were talking about a great thing the Websters did for us."

"Eh," said Jenkins. "Oh, so I was. So I was. You must watch them. You must care for them and watch them. Especially you must watch them."

He rocked slowly to and fro and thoughts ran in his brain, thoughts spaced off by the squeaking of the rocker.

You almost did it then, he told himself. You almost spoiled the dream.

But I remembered in time. Yes. Jon Webster, I caught myself in time. I kept faith, Jon Webster.

I did not tell Joshua that the

Dogs once were pets of men, that men raised them to the place they hold today. For they must never know. They must hold up their heads. They must carry on their work. The old fireside tales are gone and they must stay gone forever.

Although I'd like to tell them. Lord knows, I'd like to tell them. Warn them against the thing they must guard against. Tell them how we rooted out the old ideas from the cavemen we brought back from Europe. How we untaught them the many things they knew. How we left their minds blank of weapons, how we taught them love and peace.

And how we must watch against the day when they'll pick up those trends again—the old human way of thought.

"But, you said," persisted Joshua.

Jenkins waved his hand. "It was nothing, Joshua. Just an old robot's mumbling. At times my brain gets fuzzy and I say things that I don't mean. I think so much about the past—and you say there isn't any past."

Ichabod squatted on his haunches on the floor and looked up at Jenkins.

"There sure ain't none," he said. "We checked her, forty ways from Sunday, and all the factors check. They all add up. There isn't any past."

"There isn't any room," said Joshua. "You travel back along the line of time and you don't find the past, but another world, another bracket of consciousness. The earth would be the same, you see, or almost the same. Same trees, same rivers, same hills, but it wouldn't be the world we know. Because it has lived a different life, it has developed differently. The second back of us is not the second back of us at all, but another second, a totally separate sector of time. We live in the same second all the time. We move along within the bracket of that second, that tiny bit of time that has been allotted to our particular world."

"The way we keep time was to blame," said Ichabod. "It was the thing that kept us from thinking of it in the way it really was. For we thought all the time that we were passing through time when we really weren't, when we never have. We've just been moving along with time. We said, there's another second gone, there's another minute and another hour and another day, when, as a matter of fact the second or the minute or the hour was never gone. It was the same one all the time. It had just moved along and we had moved with it."

Jenkins nodded. "I see. Like driftwood on the river. Chips moving with the river. And the scene changes along the river bank, but the water is the same."

"That's roughly it," said Joshua. "Except that time is a rigid stream and the different worlds are more firmly fixed in place than the driftwood on the river."

"And the cobblies live in those other worlds?"

Joshua nodded. "I am sure they must."

"And now," said Jenkins, "I suppose you are figuring out a way to travel to those other worlds."

Joshua scratched softly at a flea.

"Sure he is," said Ichabod. "We need the space."

"But the cobblies—"

"The cobblies might not be on all the worlds," said Joshua. "There might be some empty worlds. If we can find them, we need those empty worlds. If we don't find space, we are up against it. Population pressure will bring on a wave of killing. And a wave of killing will set us back to where we started out."

"There's already killing," Jenkins told him, quietly.

Joshua wrinkled his brow and laid back his ears. "Funny killing. Dead, but not eaten. No blood. As if they just fell over. It has our medical technicians half crazy. Nothing wrong. No reason that they should have died."

"But they did," said Ichabod.

Joshua hunched himself closer, lowered his voice. "I'm afraid, Jenkins. I'm afraid that—"

"There's nothing to be afraid of."

"But there is. Angus told me. Angus is afraid that one of the cobblies . . . that one of the cobblies got through."

A gust of wind sucked at the fireplace throat and gamboled in the eaves. Another gust hooted in some near, dark corner. And fear came out and marched across the roof, marched with thumping, deadened footsteps up and down the shingles.

Jenkins shivered and held himself tight and rigid against another shiver. His voice grated when he spoke.

"No one has seen a cobbly."

"You might not see a cobbly."

"No," said Jenkins. "No. You might not see one."

And that is what Man had said before. You did not see a ghost and you did not see a haunt—but you sensed that one was there. For the water tap kept dripping when you had shut it tight and there were fingers scratching at the pane and the dogs would howl at something in the night and there'd be no tracks in the snow.

And there were fingers scratching on the pane.

Joshua came to his feet and stiffened, a statue of a dog, one paw lifted, lips curled back in the beginning of a snarl. Ichabod crouched, toes dug into the floor—listening, waiting.

The scratching came again.

"Open the door," Jenkins said to Ichabod. "There is something out there wanting to get in."

Ichabod moved through the hushed silence of the room. The door creaked beneath his hand. As he opened it, the squirrel came bounding in, a gray streak that leaped for Jenkins and landed in his lap.

"Why, Fatso," Jenkins said.

Joshua sat down again and his lip uncurled, slid down to hide his fangs. Ichabod wore a silly metal grin.

"I saw him do it," screamed Fatso. "I saw him kill the robin.

He did it with a throwing stick. And the feathers flew. And there was blood upon the leaf."

"Quiet," said Jenkins, gently. "Take your time and tell me. You are too excited. You saw someone kill a robin."

Fatso sucked in a breath and his teeth were chattering.

"It was Peter," he said.

"Peter?"

"Peter, the Webster."

"You said he threw a stick?"

"He threw it with another stick. He had the two ends tied together with a cord and he pulled on the cord and the stick bent—"

"I know." said Jenkins. "I know."

"You know! You know all about it?"

"Yes," said Jenkins, "I know all about it. It was a bow and arrow."

And there was something in the way he said it that held the other three to silence, made the room seem big and empty and the tapping of the branch against the pane a sound from far away, a hollow, ticking voice that kept on complaining without the hope of aid.

"A bow and arrow?" Joshua finally asked. "What is a bow and arrow?"

And that was it, thought Jenkins.

What is a bow and arrow?

It is the beginning of the end. It is the winding path that grows to the roaring road of war.

It is a plaything and a weapon and a triumph in human engineering.

It is the first faint stirring of an atom bomb.

It is a symbol of a way of life. And it's a line in a nursery rhyme.

Who killed Cock Robin?
I, said the sparrow.
With my bow and arrow,
I killed Cock Robin.

And it was a thing forgotten. And a thing relearned.

It is the thing that I've been afraid of.

He straightened in his chair, came slowly to his feet.

"Ichabod," he said, "I will need your help."

"Sure," said Ichabod. "Anything you like."

"The body," said Jenkins. "I want to wear my new body. You'll have to unseat my brain case—"

Ichabod nodded. "I know how to do it, Jenkins."

Joshua's voice had a sudden edge of fear. "What is it, Jenkins? What are you going to do?"

"I'm going to the Mutants," Jenkins said, speaking very slowly. "After all these years, I'm going to ask their help."

The shadow slithered down the hill, skirting the places where the moonlight flooded through forest openings. He glimmered in the moonlight—and he must not be seen. He must not spoil the hunting of the others that came after.

There would be others. Not in a flood, of course, but carefully controlled. A few at a time and well spread out so that the life of this wondrous world would not take alarm.

Once it did take alarm, the end would be in sight.

The shadow crouched in the darkness, low against the ground, and tested the night with twitching, high-strung nerves. He separated out the impulses that he knew, cataloguing them in his knife-sharp brain, filing them neatly away as a check against his knowledge.

And some he knew and some were mystery and others he could guess at. But there was one that held a hint of horror.

He pressed himself close against the ground and held his ugly head out straight and flat and closed his perceptions against the throbbing of the night, concentrating on the thing that was coming up the hill.

There were two of them and the two were different. A snarl rose in his mind and bubbled in his throat and his tenuous body tensed into something that was half slavering expectancy and half cringing outland terror.

He rose from the ground, still crouched, and flowed down the hill, angling to cut the path of the two who were coming up.

Jenkins was young again, young and strong and swift—swift of brain and body. Swift to stride along the wind-swept, moon-drenched hills. Swift to hear the talking of the leaves and the sleepy chirp of birds—and more than that.

Yes, much more than that, he admitted to himself.

The body was a lulu. A sledge hammer couldn't dent it and it would never rust. But that wasn't all.

Never figured a body'd make this much difference to me. Never knew how ramshackle and worn out the old one really was. A poor job from the first, although it was the best that could be done in the days when it was made. Machinery sure is wonderful, the tricks they can make it do.

It was the robots, of course. The wild robots. The Dogs had fixed it up with them to make the body. Not very often the Dogs had much truck with the robots. Got along all right and all of that—but they got along because they let one another be, because they didn't interfere, because neither one was nosey.

There was a rabbit stirring in his den—and Jenkins knew it. A raccoon was out on a midnight prowl and Jenkins knew that, too—knew the cunning, sleek curiosity that went on within the brain behind the little eyes that stared at him from the clump of hazel brush. And off to the left, curled up beneath a tree, a bear was sleeping and dreaming as he slept—a glutton's dream of wild honey and fish scooped out of a creek, with ants licked from the underside of an upturned rock as relish for the feast.

And it was startling—but natural. As natural as lifting one's feet to walk, as natural as normal hearing was. But it wasn't hearing and it wasn't seeing. Nor yet imagining. For Jenkins knew with a cool, sure certainty about the rabbit in the den and the coon in the hazel brush and the bear who dreamed in his sleep beneath the tree.

And this, he thought, is the kind

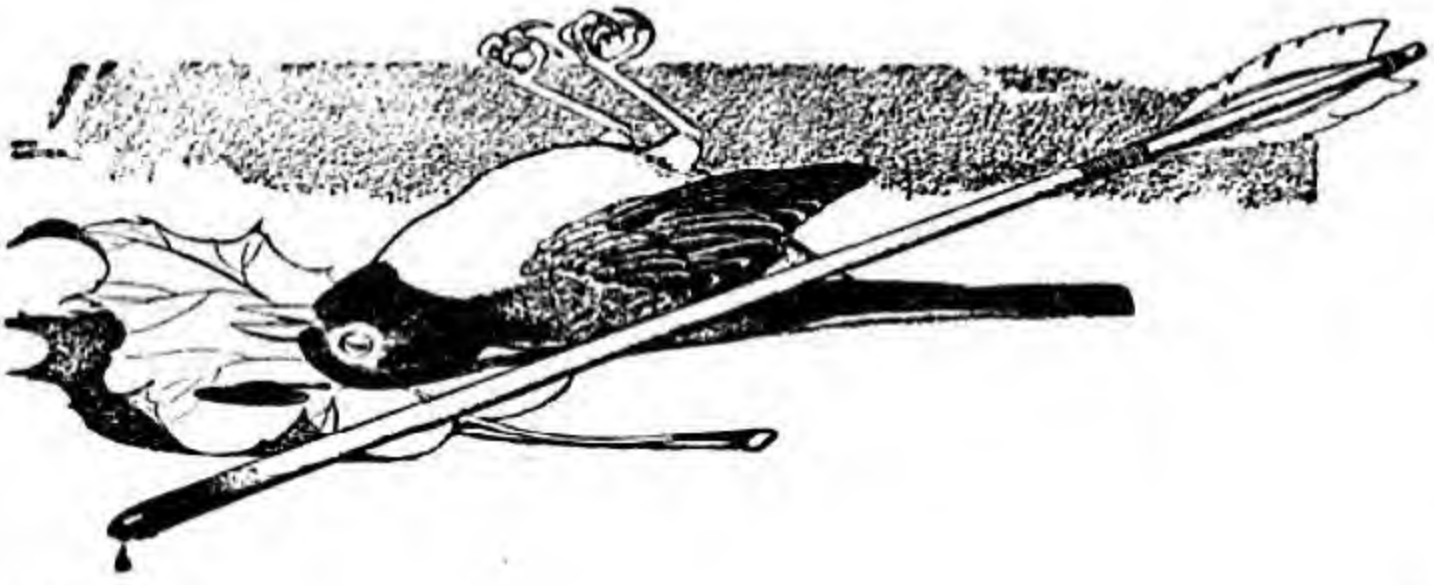
of bodies the wild robots have—for certainly if they could make one for me, they'd make them for themselves.

They have come a long ways, too, in seven thousand years, even as the Dogs have traveled far since the exodus of humans. But we paid no attention to them, for that was the way it had to be. The robots went their way and the Dogs went theirs and they did not question what one another did, had no curiosity about what one another did. While the robots were building spaceships and shooting for the stars, while they built bodies, while they worked with mathematics and mechanics, the Dogs had worked with animals, had forged a brotherhood of the things that had been wild and hunted in the days of Man—had listened to the cobblies and tried to probe the depths of time to find there was no time.

And certainly if the Dogs and robots have gone as far as this, the Mutants had gone farther still. And they will listen to me, Jenkins said, they will have to listen, for I'm bringing them a problem that falls right in their laps. Because the Mutants are men— despite their ways, they are the sons of Man. They can bear no rancor now, for the name of Man is a dust that is blowing with the wind, the sound of leaves on a summer day—and nothing more.

Besides, I haven't bothered them for seven thousand years—not that I ever bothered them. Joe was a friend of mine, or as close to a friend as a Mutant ever had. He'd talk with me when he wouldn't talk with men. They will listen to me—they will tell me what to do. And they will not laugh.

Because it's not a laughing matter. It's just a bow and arrow, but it's not a laughing matter. It might have been at one time, but history takes the laugh out of many things. If the arrow is a joke, so is the atom bomb, so is the sweep of disease-laden dust that wipes out whole cities, so is the screaming rocket that arcs and falls ten thou-



sand miles away and kills a million people.

Although now there are no million people. A few hundred, more or less, living in the houses that the Dogs built for them because then the Dogs still knew what human beings were, still knew the connection that existed between them and looked on men as gods. Looked on men as gods and told the old tales before the fire of a winter evening and built against the day when Man might return and pat their heads and say, "Well done, thou good and faithful servant."

And that wasn't right, said Jenkins striding down the hill, that wasn't right at all. For men did not deserve that worship, did not deserve the godhood. Lord knows I loved them well enough, myself. Still love them, for that matter—but not because they are men, but because of the memory of a few of the many men.

It wasn't right that the Dogs should build for Man. For they were doing better than Man had ever done. So I wiped the memory out and a long, slow work it was. Over the long years I took away the legends and misted the memory and now they call men Websters and think that's what they are.

I wondered if I had done right. I felt like a traitor and I spent bitter nights when the world was asleep and dark and I sat in the rocking chair and listened to the wind moaning in the eaves. For it was a thing I might not have the right to do. It was a thing the Websters might not have liked. For that was the hold they had on me, that they still have on me, that over the stretch of many thousand years I might do a thing and worry that they might not like it.

But now I know I'm right. The bow and arrow is the proof of that. Once I thought that Man might have got started on the wrong road, that somewhere in the dim, dark savagery that was his cradle and his toddling place, he might have got off on the wrong foot, might have taken the wrong turning. But I see that I was wrong. There's one road and one road alone that Man may travel—the bow and arrow road.

I tried hard enough, Lord knows I really tried.

When we rounded up the stragglers and brought them home to Webster House, I took away their weapons, not only from their hands but from their minds. I re-edited the literature that could be re-edited and I burned the rest. I taught them to read again and sing again and think again. And the books had no trace of war or weapons, no trace of hate or history, for history is hate—no battles or heroics, no trumpets.

But it was wasted time, Jenkins said to himself. I know now that it was wasted time. For a man will invent a bow and arrow, no matter what you do.

He had come down the long hill and crossed the creek that tumbled toward the river and now he was climbing again, climbing against the

dark, hard uplift of the cliff-crowned hill.

There were tiny rustlings and his new body told his mind that it was mice, mice scurrying in the tunnels they had fashioned in the grass. And for a moment he caught the little happiness that went with the running, playful mice, the little, unformed, uncoagulated thoughts of happy mice.

A weasel crouched for a moment on the bole of a fallen tree and his mind was evil, evil with the thought of mice, evil with remembrance of the old days when weasels made a meal of mice. Blood hunger and fear, fear of what the Dogs might do if he killed a mouse, fear of the hundred eyes that watched against the killing that once had stalked the world.

But a man had killed. A weasel dare not kill, and a man had killed. Without intent, perhaps, without maliciousness. But he had killed. And the Canons said one must not take a life.

In the years gone by others had killed and they had been punished. And the man must be punished, too. But punishment was not enough. Punishment, alone, would not find the answer. The answer must deal not with one man alone, but with all men, with the entire race. For what one of them had done, the rest were apt to do. Not only apt to do, but bound to do—for they were men, and men had killed before and would kill again.

The Mutant castle reared black against the sky, so black that it shimmered in the moonlight. No light came from it and that was not strange at all, for no light had come from it ever. Nor, so far as anyone could know, had the door ever opened into the outside world. The Mutants had built the castles, all over the world, and had gone into them and that had been the end. The Mutants had meddled in the affairs of men, had fought a sort of chuckling war with men and when the men were gone, the Mutants had gone, too.

Jenkins came to the foot of the broad stone steps that led up to the door and halted. Head thrown back, he stared at the building that reared its height above him.

I suppose Joe is dead, he told himself. Joe was long-lived, but he was not immortal. He would not live forever. And it will seem strange to meet another Mutant and know it isn't Joe.

He started the climb, going very slowly, every nerve alert, waiting for the first sign of chuckling humor that would descend upon him.

But nothing happened.

He climbed the steps and stood before the door and looked for something to let the Mutants know that he had arrived.

But there was no bell. No buzzer. No knocker. The door was plain, with a simple latch. And that was all.

Hesitantly, he lifted his fist and knocked and knocked again, then waited. There was no answer. The door was mute and motionless.

He knocked again, louder this time. Still there was no answer.

Slowly, cautiously, he put out a

hand and seized the latch, pressed down with his thumb. The latch gave and the door swung open and Jenkins stepped inside.

"You're cracked in the brain," said Lupus. "I'd make them come and find me. I'd give them a run they would remember. I'd make it tough for them."

Peter shook his head. "Maybe that's the way you'd do it, Lupus, and maybe it would be right for you. But it would be wrong for me. Websters never run away."

"How do you know?" the wolf asked pitilessly. "You're just talking through your hair. No Webster had to run away before and if no Webster had to run away before, how do you know they never—"

"Oh, shut up," said Peter.

They traveled in silence up the rocky path, breasting the hill.

"There's something trailing us," said Lupus.

"You're just imagining," said Peter. "What would be trailing us?"

"I don't know, but—"

"Do you smell anything?"

"Well, no."

"Did you hear anything or see anything?"

"No, I didn't, but—"

"Then nothing's following us," Peter declared, positively. "Nothing ever trails anything any more."

The moonlight filtered through the treetops, making the forest a mottled black and silver. From the river valley came the muffled sound of ducks in midnight argument. A soft breeze came blowing up the hillside, carrying with it a touch of river fog.

Peter's bowstring caught in a piece of brush and he stopped to untangle it. He dropped some of the arrows he was carrying and stooped to pick them up.

"You better figure out some other way to carry them things." Lupus growled at him. "You're all the time getting tangled up and dropping them and—"

"I've been thinking about it." Peter told him, quietly. "Maybe a bag of some sort to hang around my shoulder."

They went on up the hill.

"What are you going to do when you get to Webster House?" asked Lupus.

"I'm going to see Jenkins," Peter said. "I'm going to tell him what I've done."

"Fatso's already told him."

"But maybe he told him wrong. Maybe he didn't tell it right. Fatso was excited."

"Lame-brained, too," said Lupus.

They crossed a patch of moonlight and plunged on up the darkling path.

"I'm getting nervous," Lupus said. "I'm going to go back. This is a crazy thing you're doing. I've come part way with you, but "

"Go back, then," said Peter, bitterly. "I'm not nervous. I'm—"

He whirled around, hair rising on his scalp.

For there was something wrong—something in the air he breathed, something in his mind—an eerie, disturbing sense of danger and much more than danger, a loathsome feel-

ing that clawed at his shoulder blades and crawled along his back with a million prickly feet.

"Lupus!" he cried. "Lupus!"

A bush stirred violently down the trail and Peter was running, pounding down the trail. He ducked around a bush and skidded to a halt. His bow came up and with one motion he picked an arrow from his left hand, nocked it to the cord.

Lupus was stretched upon the ground, half in shade and half in moonlight. His lip was drawn back to show his fangs. One paw still faintly clawed.

Above him crouched a shape. A shape—and nothing else. A shape that spat and snarled, a stream of angry sound that screamed in Peter's brain. A tree branch moved in the wind and the moon showed through and Peter saw the outline of the face—a faint outline, like the half erased chalk lines upon a dusty board. A skull-like face with mewling mouth and slitted eyes and ears that were tufted with tentacles.

The bow cord hummed and the arrow splashed into the face—splashed into it and passed through and fell upon the ground. And the face was there, still snarling.

Another arrow nocked against the cord and back, far back, almost to the ear. An arrow driven by the snapping strength of well-seasoned straight-grained hickory—by the hate and fear and loathing of the man who pulled the cord.

The arrow spat against the chalky outlines of the face, slowed and shivered, then fell free.

Another arrow and back with the cord. Farther yet this time. Farther for more power to kill the thing that would not die when an arrow struck it. A thing that only slowed an arrow and made it shiver and then let it pass on through

Back and back—and back. And then it happened.

The bow string broke.

For an instant, Peter stood there with the useless weapon dangling in one hand, the useless arrow hanging from the other. Stood and stared across the little space that separated him from the shadow horror that crouched across the wolf's gray body.

And he knew no fear. No fear, even though the weapon was no more. But only flaming anger that shook him and a voice that hammered in his brain with one screaming word:

KILL—KILL—KILL

He threw away the bow and stepped forward, hands hooked at his side, hooked into puny claws.

The shadow backed away—backed away in a sudden pool of fear that lapped against its brain—fear and horror at the flaming hatred that beat at it from the thing that walked toward it. Hatred that seized and twisted it. Fear and horror it had known before—fear and horror and disquieting resignation— but this was something new. This was a whiplash of torture that seared across its nerves, that burned across its brain.

This was hatred.

The shadow whimpered to itself —whimpered and mewed and backed

away and sought with frantic fingers of thought within its muddled brain for the symbols of escape.

The room was empty—empty and old and hollow. A room that caught up the sound of the creaking door and flung it into muffled distances, then hurled it back again. A room heavy with the dust of forgetfulness, filled with the brooding silence of aimless centuries.

Jenkins stood with the door pull in his hand, stood and flung all the sharp alertness of the new machinery that was his body into the corners and the darkened alcoves. There was nothing. Nothing but the silence and the dust and darkness. Nor anything to indicate that for many years there had been anything but silence, dust and darkness. No faintest tremor of a residuary thought, no footprints on the floor, no fingermarks scrawled across the table.

An old song, an incredibly old song—a song that had been old when he had been forged, crept out of some forgotten corner of his brain. And he was surprised that it still was there, surprised that he had ever known it—and knowing it, dismayed at the swirl of centuries that it conjured up, dismayed at the remembrance of the neat white houses that had stood upon a million hills, dismayed at the thought of men who had loved their acres and walked them with the calm and quiet assurance of their ownership.

Annie doesn't live here any more.

Silly, said Jenkins to himself. Silly that some absurdity of an all-but-vanished race should rise to haunt me now. Silly.

Annie doesn't live here any more.

Who killed Cock Robin? I, said the sparrow—

He closed the door behind him and walked across the room.

Dust-covered furniture stood waiting for the man who had not returned. Dust-covered tools and gadgets lay on the table tops. Dust covered the titles of the rows of books that filled the massive bookcase.

They are gone, said Jenkins, talking to himself. And no one knew the hour or the reason of their going. Nor even where they went. They slipped off in the night and told no one they were leaving. And sometimes, no doubt, they think back and chuckle—chuckle at the thought of our thinking that they still are here, chuckle at the watch we keep against their coming out.

There were other doors and Jenkins strode to one. With his hand upon the latch he told himself the futility of opening it, the futility of searching any further. If this one room was old and empty, so would be all the other rooms.

His thumb came down and the door came open and there was a blast of heat, but there was no room. There was desert—a gold and yellow desert stretching to a horizon that was dim and burnished in the heat of a great blue sun.

A green and purple thing that might have been a lizard, but wasn't, skittered like a flash across the sand, its tiny feet making the sound of eerie whistling.

Jenkins slammed the door shut, stood numbed in mind and body.

A desert. A desert and a thing that skittered. Not another room, not a hall, nor yet a porch—but a desert.

And the sun was blue—blue and blazing hot.

Slowly, cautiously, he opened the door again, at first a crack and then a little wider.

The desert still was there.

Jenkins slammed the door and leaned with his back against it, as if he needed the strength of his metal body to hold out the desert, to hold out the implication of the door and desert.

They were smart, he told himself. Smart and fast on their mental feet. Too fast and too smart for ordinary men. We never knew just how smart they were. But now I know they were smarter than we thought.

This room is just an anteroom to many other worlds, a key that reaches across unguessable space to other planets that swing around unknown suns. A way to leave this earth without ever leaving it—a way to cross the void by stepping through a door.

There were other doors and Jenkins stared at them, stared and shook his head.

Slowly he walked across the room to the entrance door. Quietly, unwilling to break the hush of the dust-filled room, he lifted the latch and let himself out and the familiar world was there. The world of moon and stars, of river fog drifting up between the hills, of treetops talking to one another across the notches of the hills.

The mice still ran along their grassy burrows with happy mouse thoughts that were scarcely thoughts. An owl sat brooding in the tree and his thoughts were murder.

So close, thought Jenkins. So close to the surface still, the old blood-hunger, the old bone-hate. But we're giving them a better start than Man had—although probably it would have made no difference what kind of a start mankind might have had.

And here it is again, the old blood-lust of Man, the craving to be different and to be stronger, to impose his will by things of his devising—things that make his arm stronger than any other arm or paw, to make his teeth sink deeper than any natural fang, to reach and hurt across distances that are beyond his own arm's reach.

I thought I could get help. That is why I came here. And there is no help.

No help at all. For the Mutants were the only ones who might have helped and they have gone away.

It's up to you, Jenkins told himself, walking down the stairs. Mankind's up to you. You've got to stop them, somehow. You've got to change them somehow. You can't let them mess up the thing the Dogs are doing. You can't let them turn the world again into a bow and arrow world.

He walked through the leafy darkness of the hollow and knew the scent of moldy leaves from the autumn's harvest beneath the new

green of growing things and that was something, he told himself, he'd never known before.

His old body had no sense of smell.

Smell and better vision and a sense of knowing, of knowing what a thing was thinking, to read the thoughts of raccoons, to guess the thoughts of mice, to know the murder in the brains of owls and weasels.

And something more—a faint and wind-blown hatred, an alien scream of terror.

It flicked across his brain and stopped him in his tracks, then sent him running, plunging up the hillside, not as a man might run in darkness, but as a robot runs, seeing in the dark and with the strength of metal that has no gasping lungs or panting breath.

Hatred—and there could be one hatred only that could be like that.

The sense grew deeper and sharper as he went up the path in leaping strides and his mind moaned with the fear that sat upon it—the fear of what he'd find.

He plunged around a clump of bushes and skidded to a halt.

The man was walking forward, with his hands clenched at his side and on the grass lay the broken bow. The wolf's gray body lay half in the moonlight, half in shadow and backing away from it was a shadowy thing that was half-light, half-shadow, almost seen but never surely, like a phantom creature that moves within one's dream.

"Peter!" cried Jenkins, but the words were soundless in his mouth.

For he sensed the frenzy in the brain of the half-seen creature, a frenzy of cowering terror that cut through the hatred of the man who walked forward toward the drooling, spitting blob of shadow. Cowering terror and frantic necessity—a necessity of finding, of remembering.

The man was almost on it, walking straight and upright—a man with puny body and ridiculous fists—and courage. Courage, thought Jenkins, courage to take on hell itself. Courage to go down into the pit and rip up the quaking flagstones and shout a lurid, obscene jest at the keeper of the damned.

Then the creature had it—had the thing it had been groping for, knew the thing to do. Jenkins sensed the flood of relief that flashed across its being, heard the thing, part word, part symbol, part thought, that it performed. Like a piece of mumbo-jumbo, like a spoken charm, like an incantation, but not entirely that. A mental exercise, a thought that took command of the body—that must be nearer to the truth.

For it worked.

The creature vanished. Vanished and was gone—gone out of the world.

There was no sign of it, no single vibration of its being. As if it had never been.

And the thing it had said, the thing that it had thought? It went like this. Like this—

Jenkins jerked himself up short. It was printed on his brain and he knew it, knew the word and thought and the right inflection—but he

must not use it, he must forget about it, he must keep it hidden.

For it had worked on the cobbly. And it would work on him. He knew that it would work.

The man had swung around and now he stood limp, hands dangling at his side, staring at Jenkins.

His lips moved in the white blur of his face. "You . . . you—"

"I am Jenkins," Jenkins told him. "This is my new body."

"There was something here," said Peter.

"It was a cobbly," said Jenkins. "Joshua told me one had gotten through."

"It killed Lupus," said Peter.

Jenkins nodded. "Yes, it killed Lupus. And it killed many others. It was the thing that has been killing."

"And I killed it," said Peter. "I killed it . . . or drove it away . . . or something."

"You frightened it away," said Jenkins. "You were stronger than it was. It was afraid of you. You frightened it back to the world it came from."

"I could have killed it," Peter boasted, "but the cord broke—"

"Next time," said Jenkins, quietly, "you must make stronger cords. I will show you how it's done. And a steel tip for your arrow—"

"For my what?"

"For your arrow. The throwing stick is an arrow. The stick and cord you throw it with is called a bow. All together, it's called a bow and arrow."

Peter's shoulders sagged. "It was done before, then. I was not the first?"

Jenkins shook his head. "No, you were not the first."

Jenkins walked across the grass and lay his hand upon Peter's shoulder.

"Come home with me, Peter."

Peter shook his head. "No. I'll

sit here with Lupus until the morning comes. And then I'll call in his friends and we will bury him."

He lifted his head to look into Jenkins' face. "Lupus was a friend of mine. A great friend, Jenkins."

"I know he must have been," said Jenkins. "But I'll be seeing you?"

"Oh, yes," said Peter. "I'm coming to the picnic. The Webster picnic. It's in a week or so."

"So it is," said Jenkins, speaking very slowly, thinking as he spoke. "So it is. And I will see you then."

He turned around and walked slowly up the hill.

Peter sat down beside the dead wolf, waiting for the dawn. Once or twice, he lifted his hand to brush at his cheeks.

They sat in a semicircle facing Jenkins and listened to him closely.

"Now, you must pay attention," Jenkins said. "That is most important. You must pay attention and you must think real hard and you must hang very tightly to the things you have—to the lunch baskets and the bows and arrows and the other things."

One of the girls giggled. "Is this a new game, Jenkins?"

"Yes," said Jenkins, "sort of. I guess that is what it is—a new game. And an exciting one. A most exciting one."

Someone said: "Jenkins always thinks up a new game for the Webster picnic."

"And now," said Jenkins, "you must pay attention. You must look at me and try to figure out the thing I'm thinking—"

"It's a guessing game," shrieked the giggling girl. "I love guessing games."

Jenkins made his mouth into a smile. "You're right," he said. "That's exactly what it is—a guessing game. And now if you will pay attention and look at me—"

"I want to try out these bows and arrows," said one of the men. "After this is over, we can try them out, can't we, Jenkins?"

"Yes," said Jenkins patiently, "after this is over you can try them out."

He closed his eyes and made his brain reach out for each of them, ticking them off individually, sensing the thrilled expectancy of the minds that yearned toward his, felt the little probing fingers of thought that were dabbing at his brain.

"Harder," Jenkins thought. "Harder! Harder!"

A quiver went across his mind and he brushed it away. Not hypnotism—nor yet telepathy, but the best that he could do. A drawing together, a huddling together of minds—and it was all a game.

Slowly, carefully, he brought out the hidden symbol—the words, the thought and the inflection. Easily he slid them into his brain, one by one, like one would speak to a child, trying to teach it the exact tone, the way to hold its lips, the way to move its tongue.

He let them lay there for a moment, felt the other minds touching them, felt the fingers dabbing at them. And then he thought them

aloud—thought them as the cobbly had thought them.

And nothing happened. Absolutely nothing. No click within his brain. No feeling of falling. No vertigo. No sensation at all.

So he had failed. So it was over. So the game was done.

He opened his eyes and the hillside was the same. The sun still shone and the sky was robin's egg.

He sat stiffly, silently and felt them looking at him.

Everything was the same as it had been before.

Except—There was a daisy where the clump of Oswego tea had bloomed redly before. There was a pasture rose beside him and there had been none when he had closed his eyes.

"Is that all there's to it?" asked the giggly girl, plainly disappointed.

"That is all," said Jenkins.

"Now we can try out the bows and arrows?" asked one of the youths.

"Yes," said Jenkins, "but be careful. Don't point them at one another. They are dangerous. Peter will show you how."

"We'll unpack the lunch," said one of the women. "Did you bring a basket, Jenkins?"

"Yes," said Jenkins. "Esther has it. She held it when we played the game."

"That's nice," said the woman. "You surprise us every year with the things you bring."

And you'll be surprised this year, Jenkins told himself. You'll be surprised at packages of seeds, all very neatly labeled.

For we'll need seeds, he thought to himself. Seeds to plant new gardens and to start new fields—to raise food once again. And we'll need bows and arrows to bring in some meat. And spears and hooks for fish.

Now other little things that were different began to show themselves. The way a tree leaned at the edge of the field. And a new kink in the river far below.

Jenkins sat quietly in the sun, listening to the shouts of the men and boys, trying out the bows and arrows, hearing the chatter of the women as they spread the cloth and unpacked the lunches.

I'll have to tell them soon, he told himself. I'll have to warn them to go easy on the food—not to gobble it up all at one sitting. For we will need that food to tide us over the first day or two, until we can find roots to dig and fish to catch and fruit to pick.

Yes, pretty soon I'll have to call them in and break the news to them. Tell them they're on their own. Tell them why. Tell them to go ahead and do anything they want to. For this is a brand-new world.

Warn them about the cobblies.

Although that's the least important. Man has a way with him—a very vicious way. A way of dealing with anything that stands in his path.

Jenkins sighed.

Lord help the cobblies, he said.

THE END.

AGE OF UNREASON

BY ALFRED COPPEL, JR.

Illustrated by Napoli

In all the history of Mankind, there was just one period —the Age of Unreason—where no time-traveler dared visit. The reason was quite plain, when you considered it—

"In a mass refusal to accept truth, in skepticism and suspicion of values that surpassed their power to understand, in the judgment of the variant in terms of the norm, and in militant persecution of any revolutionary scientific or moral concept . . . therein lay the madness of this strange age."

Essays on Tellurian History, Quintus Bland, Geneva Keep Press, 12.50 Cr.

Mikal Torres stood on a low mound and watched the Diggers at work. There was a hypnotic grace about the movements of the almost-human machines that soothed him, relaxing the harsh planes of his weathered face.

Through a curtain of shimmering heat waves, he could see the whole panorama of the dig—the machines and the men of Team One who served them. The men floating through the air in their Ingravity harnesses, and the Diggers feeding voraciously on the sandy earth, brought to mind the ancient legends of the Underworlds—of Nidhogg gnawing at the roots of Yggdrasil. The bell-mouthed intakes swung deliberately back and forth across the surfaces of the dig, and as tons of rock and soil vanished, the outlines of the buried city took shape. There was a mind-

less purpose to all the teeming, silent activity that was at once stirring and eerie.

Torres wiped the sweat from his forehead and smiled wryly. He was letting his imagination run away with him. The workings of an archeological team were hardly so mysterious. The city that was rising from the earth was not Valhalla or Mu. It was simply Dawn Washington. And the Diggers were not Nidhoggs, uncovering evil and tragedy to the light of the sun. They were only clever, labor-saving devices. Nor were the floating men imps and demons. They were the last few visionaries and die-hards that comprised Archeological Team One—*One* and *only*.

From the deepest part of the dig a man rose into the air and moved toward him. Torres recognized Jo Webb, his assistant. He carried a roll of papers under his arm. Torres nodded a greeting as Webb alighted beside him.

"Got something?"

Webb handed over the roll. "Found another Time Capsule down there. It was cracked by bomb concussion, but most of the stuff in it is recognizable." He grinned and added: "Our ancestors were certainly anxious that posterity know them. This is the third capsule in six months."

Torres took the papers and spoke dryly. "A combination of stupidity and conceit. Every time they became involved in a useless war, they buried capsules like crazy."

"Queer lot," agreed the younger man, "Sometimes I think I'd like to hop a Shuttle and get to see them first hand—" He caught the dark look that crossed the other's face and stopped abruptly. "I . . . I'm sorry, chief, I should have remembered how you feel about the use of Shuttles."

Torres took his pipe from his jacket, lit up, and inhaled deeply before he replied. His expression was somber.

"You misunderstand, Jo. I'm not against time travel *per se*. In fact I am quite willing to admit that it is a triumph of engineering and applied physics. It's Temporal Exploitation that I resent. If the Shuttles were placed at the disposal of competent archeologists . . . well think of the tremendous impetus it would give our work. But instead—look." He indicated the team at work in the dig. "The last team. We are anachronisms. We grub in the dirt of ancient cities for scientific and cultural treasures that won't be there because they were stolen centuries ago by Temporal Agents that haven't even started out yet! We meet one every time we turn around. And the whole Temporal Ex program is in the hands of . . . of a bureaucrat. And a rather stupid one at that."

Jo Webb blinked at that. It was not considered good form to criticize the top men in the Institute. And Webb recalled that the present Director of Temporal Ex had married the girl Torres had once thought his fiancée. There were implications in Torres' hasty words that were more than just official.

"Loren Rhys is a fool," con-

tinued Torres dispassionately. "He knows very little of history, and even less about ordinary mass psychology. All he's well versed in is handshaking. One of these days he's going to run one of his Agents into a tight spot and it will be very unfortunate."

"I just hope it isn't Jannine, chief—" Jo Webb said earnestly.

Torres smiled bitterly. "No, Jo, Lady Rhys is too . . . handsome for that, isn't she?"

Webb reflected on the old saying about sour grapes, but he was too fond of his chief to say anything. Instead he changed the subject. Indicating the papers, he said:

"This stuff, chief, it looks like old newsprint. It was on the top deck of the capsule, so I thought I'd bring it right up. See, the date on one is readable as July 1947. I know your interest in the period, so—"

Torres sat down cross-legged on the ground and unrolled the brittle sheets. He began to work on the ancient Arabic numbers and Phoenician script. It was complicated, but Torres had plenty of experience with the characters.

Suddenly he looked up. Jo Webb was surprised to see that he was pale under his deep tan.

"What's the matter?"

Torres was on his feet, an expression of worried perplexity on his face.

"Jo. You follow the reports on Temporal Ex closely, don't you?"

"Oh, now, wait just a minute . . . I don't want you thinking that I—"

Torres made an impatient gesture. "No . . . not that. But I thought Twentieth Century Dawn Civilization was the exclusive field of Archeo. Have the Temporal Ex people got permission to make a penetration? This is important, Jo." His voice was harsh and urgent. Jo Webb could not remember ever having seen him so upset.

"Why . . . I . . . I thought you knew. Director Rhys got permission from the Commandery to try it. There was an all-points bulletin on the visor about it day before yesterday. Of course . . . the day you went up to N'york to bring down the spare Digger grids . . . you must have missed it."

"You're right—I missed it! Why wasn't I told?"

"Frankly, I thought you knew. And no one else would want the job of telling you that Temporal Ex was going to poach on us—"

"What are they after this time?" His voice was tense.

"Some document that research located here in Washington."

"A Declaration of Independence!"

"Why, yes. That was it. How did you know?"

"That Rhys!" cried Torres furiously. "That incompetent idiot! Hasn't he ever read Bland's 'History'?" He fell silent, as though still undecided about something. Then he snapped an order to his assistant. "Get out of that Ingrav and let me have it! Clear the radio and visor for a priority message

and flag me the first stratojet for Geneva!"

Jo Webb nodded dumbly and lent a hand with the Iugrav harnesses fasteners. "Can you tell me what's the matter?"

"Another paradox. And this time I have to see if I can't break the chain of events." He smiled sardonically at the younger man's incomprehension. His expression showed a confidence he did not feel. "It had better be right, Jo. It concerns Jannine."

"Variable futures based on certain key events, or predestination with allowances already made for the perturbations inherent in time travel . . . which of these concepts is correct, we can but guess. The individuality of human nature might prefer the former, but most evidence seems to support the latter."

Virgil Duane, Director of Temporal Research, World Institute of Entropic Psychohistory.

Rhys read the message over again with an expression of disdain. That Torres! Embittered, passé, and a poor loser to boot. Why couldn't he stick to his digging and leave policy matters to the proper authorities? It had taken a great deal of work to get permission from the Commandery for this next penetration—and how like Torres to make this clumsy attempt to stop it.

The very act of sending the message direct, instead of through the proper channels, showed quite clearly how little the man cared for the proper forms—and this annoyed Loren Rhys almost as much as the inferred slur on Jannine and the jealousy that could be read between the lines.

But it was just as well that Torres had written as he did. Now, at last, Rhys had something concrete to show the Commandery. Slander was a serious offense.

Techman Dugal came through the Shuttle Room door and found his chief slumped angrily behind his magnificent desk.

"Trouble?"

Rhys handed him the message, without comment. Dugal read it over and shrugged.

"Surely you aren't letting this upset you?"

Rhys' rubicund face seemed to swell. "Shouldn't I?" he demanded.

"You know Torres."

"Too well."

"Then you know that every time he runs into some irrelevant scrap of information he raises the hue and cry about Temporal Exploitation."

"Not that. Look what he says about Lady Rhys!" exclaimed the Director waving his pudgy hand angrily.

"He doesn't actually *say* anything."

"Don't split hairs!" snapped Rhys. "He as much says that she is . . . ugh . . . insane!"

"You could send someone else in on this penetration," offered the Techman tentatively.

"Certainly not! Jannine is the best Temporal Agent we have. This one is made to order for her. I don't intend to keep her out of action just because Mr. Mikal Tor-

res says to keep her out of 1947!" He paused for breath and then added: "There is absolutely no reason why I should keep Lady Rhys out of any time sector whatever! And any inferences to the contrary I shall consider as slanderous."

Dugal shrugged. "You know best."

There wasn't much else he could say. When the subject of Jannine Rhys came up, the Director was hardly unprejudiced. After all, the woman was meat, wine, and sinecure for him. She *was* the best Agent in the Institute. Her record proved it—and the fact that she was also the Director's wife only served to give her talents wider scope. Sometimes, though, reflected Dugal, it was difficult to see how—even with Jannine's brilliance behind him—Rhys could have come so far. One thing was certain, without her he was just another balding bureaucrat. He was stubborn and not too competent. On occasion, he was even a bit stupid. Little wonder, then, that he should react so violently to anything Torres might have to say. They had been rivals for Jannine once. Now they were rivals in other things. And Torres must have been sunstruck when he sent that cryptic message. Jannine Rhys was as sound as a credit—and a lot better to look at. Torres should have known what would happen. He should have known better.

Jannine was . . . well, Jannine. Dugal licked his lips as he conjured up the picture she made in one of her favorite metal-mesh gowns. Bare backed, bare legged and thighed, and very little elsewhere—and on Jannine it looked good. But she was a great deal more than just good to look at. She was smooth, competent, and cold as crystal. She was capricious and willful—even cruel sometimes. But as an Agent, she was the best.

People outside the Institute wondered why Rhys allowed Jannine to work as a Temporal Agent. It wasn't an arrangement the average man would like—having his wife a Canterbury pilgrim one week and a Roman Vestal the next. But actually no one *allowed* Jannine Rhys to do anything. The word simply didn't apply. She had long ago decided that the Institute was the most powerful force in the world. And the men who ran it ran the rest of the planet. In other eras the world rested in the hands of soldiers, statesman, even artists. Had she lived then, she would have married one of them. But here and now, it was the Institute personnel who led—with Temporal Ex in the van—and Jannine Rhys in the first rank of the elite. It was the only workable arrangement as far as she was concerned. So she was a Temporal Agent—and a good one.

It was she who brought back the Holy Grail, and the pictures of the destruction of Pompeii that were later made into the dominant theme of the fabulous Red Sun Symchromy, and the original manuscript of the Rubiyat, *and* the first draft of Magna Carta, and—but

why go on? In a civilization of cultural pack-rats Jannine was the smartest and the best. It was Rhys' mission on earth to see to it that no one ever forgot that. No one ever did.

Rhys could not help feeling proud of himself in spite of his annoyance with Torres. The Twentieth Century of the Dawn Civilization—called the Age of Unreason by the scriveners—had not yet been tapped, and it was a repository in time for a great many cultural objects that had thus far escaped the grasping hands of the world of AD 3527. The legendary document known as "A Declaration of Independence" was one such. A prize like that would be worth a post on the Commandery. Careful research had shown that during the period AD 1849-1967 it had rested in a public building named Capitol in the barbarian city of Dawn Washington. For many centuries, the archeologists had debated the existence of the document, some offering strong arguments that it existed only in the minds of the North American primitives. But Rhys knew where and when to look. All that remained was to loose the imperative talents of his wife on it and it would soon rest in the Institute museum. Jannine had never failed. Whether she chose to appear as a goddess or merely a visitor from the future, she came back with the goods—always.

He looked again at Torres' message and smiled scornfully. All the anger was gone out of him now.

"Dugal," he ordered somewhat pompously, "have the Shuttle ready for Lady Rhys at 1700."

"Then you aren't going to wait and see what Torres has on his mind?"

"It is plain that Torres is trying to discredit this penetration just as he has all Temporal Exploitation. It is, after all, a negation of his work as an archeologist. The Commandery and the public are with us and against him and his kind. He can't stand that. Sour grapes. Lady Rhys and I have done done good work here. The record bears us out in this and I'll not stand for any interference from that one!"

The Techman nodded silently.

"1700 then," repeated Rhys unnecessarily.

"In thirty minutes," replied the Techman, and returned to the Shuttle Room.

"The human concept of randomness is questionable. I believe that there is a cosmic pattern to randomness."

Toran Long, Philosophical Mores, N'york Guild, 3.50 Cr.

Mikal Torres sat tensely on the edge of his seat as the stratojet slanted sharply upward. He motioned the stewardess away irritably as she came to offer hypnoprene. He could not wast time indulging himself in the pleasant dreams that his fellow passengers were enjoying. He would reach Geneva Keep by 2100—in time *if* Rhys had followed his instructions. A big if. Meanwhile—

There was work to do. He spread

the two plastic sealed sheets before him and adjusted his portable microscanner. From his pocket pouch he extracted several volumes of microfilm and began to devour their contents.

There might have been an error of omission in his primary conclusions. He had been excited. The whole affair had the maddening inevitability of an apparent paradox. Time travel was like that. But there was something else here. Something obvious, and yet unseen. He must find the variable and change it. *If* a variable existed. Otherwise—but he did not like to think about that.

His love for Jannine was dead. There was no doubt of that. But he could not let her face the unknown without at least trying to help. And if anyone could help it was he—it could be no one else. But there were so many probability factors to integrate. He could not believe her anything but sane. Willful and cruel, yes. But a superbly integrated personality. His first guess had been a bad one—he was certain of it.

He turned to study the unwinking stars that had shown in the black sky beyond the port. An illusive phrase kept gnawing at his subconscious. Something . . . something—

The Age of Unreason!

Understanding—and cold fear. The first guess *had* been wrong. Completely, devastatingly wrong. And from somewhere came the awful conviction that in the long view he had not succeeded. If only he was in time! He glanced at his chronometer. It was 1630.

"No matter what the scientists tell us, we who understand know that man is but a puppet. The power that moves the strings is—Kismet."

Ancient Mysteries of the East, Muhammed Ali Singh, Delhi Press, 5.00 Cr.

Rhys was composing his letter of protest to the Commandery about the untoward behavior of Mikal Torres when his wife came through the outer door. As always, he stopped work just to look at her walking toward him. And as always it was a pleasure. The graceful swing of her slim hips, the round shoulders and high breasts revealingly hidden in a spun-glass day tunic, topped by the classic face and the startlingly silver hair, sent a thrill of pleasure through him.

Rhys suspected that Jannine's beauty was the main reason for her spectacular success as an Agent. He could well imagine the rapture of the Dawn Civilization primitives when this vision of loveliness materialized out of thin air before them. Her very caprices were bowed to as to the will of a goddess. Her confidence was superb. On one penetration—into Medieval France it was—she had appeared before a simple peasant girl and exhorted her to take up arms and drive some petty prince or other out of a city that Jannine had wanted to exploit. The girl had donned man's armor and ridden forth—a saint. Rhys did not like to dwell on the possible repercussions of that kind of inter-

ference, but it had come out well. The world of 3527 had not been affected. Still it showed what Jannine could do.

An ironic footnote to the whole business was the find made by archeologists that the peasant girl had been burned at the stake for her trouble.

Nevertheless, it proved that Lady Rhys was a capable and resourceful Agent—and those were the primary attributes of a successful Agent. And this, thought the Director smilingly, was the genius that Torres wanted kept inactive! What a chance of that!

"What are you grinning about?" Even her voice was lovely.

"Read this and tell me if we haven't taken enough from our old friend Torres."

He handed her the note. Her eyes ran lightly over the angular characters:

PRIORITY MEMORANDUM TO: LOREN RHYS, DIRECTOR OF TEMPORAL EXPLOITATION DIVISION, WORLD INSTITUTE OF ENTROPIC PSYCHOHISTORY, FROM: MIKAL TORRES, FIELD DIRECTOR TEAM ONE NORTH AMERICAN ARCHEOLOGICAL DIVISION. This is important. Keep Jannine out of 1947 sector Dawn Civilization. Make immediate arrangements to have her psychoed. Have run into pertinent data that cannot be radioed, so I am bringing it in to you. Arrive Geneva Keep Skyport 2100. Meet me. I may be misinterpreting this stuff, but we cannot take a chance with Jannine. Don't let your personal antipathy toward me bollix things up. I repeat. Keep Jannine out of 1947. I cannot overemphasize this. End message.

"Are you worried?" asked Rhys with an expansive smile.

"Should I be?" Jannine's voice was cool and perfectly modulated.

"No."

Jannine smiled and helped herself to a cigarette. Rhys lit it and she drew in a puff of perfumed smoke. "He seems to think I'm breaking up," she commented idly.

"Torres is an atavism. He's lived so long among his musty papers that he's forgotten that modern people simply don't go—insane. Furthermore, he knows that we have been ready for this penetration for weeks. There was an all-points bulletin about it. He is just trying to discredit our work here. He hates everything about it because I got you and he didn't. As far as the psycho request—"

"Do you think it necessary?" Jannine inspected her husband through heavy lidded eyes.

"Certainly not. I know you are quite capable. In fact I was just working over my letter of protest to the Commandery when you came in. What he says is slanderous, you know."

She took the paper and glanced over it. "Make it stronger," she said.

"Stronger?"

"Make him squirm. Break him. You can, you know."

Rhys nodded. There were times when his wife's intensity of feeling frightened him. To break an awkward silence he said:

"Dugal is getting ready. Your start at 1700."

She rose from the desk languor-

ously. "I know. I'll go make preparations."

Rhys watched her leave thinking exactly the same thoughts he had been thinking as she entered.

"Time Shuttles work only one way. Into the past. The future, as an unintegrated mass of space-time-individual factors remains a closed book to us. In operation, the Shuttle blows a mesotronic stasis through the 'fabric' of the continuum after places and times have been superimposed by the master integrator.

"The principle was accidentally discovered during the teleportation experiments of AD 3499, and has been in constant use since then. The Shuttle is unfortunately an inefficient machine. The load factor is small and seven hundred cubic feet of machinery are needed to move 150 pounds across time. The power requirements are astronomical.

"The most important requirement in an Agent is the ability to keep hands off the alpha line of probability. The slight distortion of the entropic development pattern caused by the appearance of an Agent is generally compensated for by the overall trends of Psychohistory . . . that cosmic leash first speculated upon by a Mr. Asimov of the Science Fiction school of Dawn Civilization writers . . ."

Institute White Paper of Temporal Exploitation, Geneva Keep Press, 2.50 Cr.

At 1700, Jannine stepped onto the platform of the Shuttle and the wire-mesh curtains set in place. She was almost naked, for, as she said, sex played a very important role in the life of the Twentieth Century barbarians, and her research on the period had shown that the contemporary females used it to attain their objectives when dealing with the males.

Rhys was there, beaming as usual. The affair of the message from Torres had been put out of his mind.

Jannine said, "Lay the stasis in an inconspicuous spot for the time check. I'll go through and report back in an hour."

Dugal closed the switch and relays clucked pettishly within the Shuttle as the wires began to glow. Jannine vanished, and the Techman and the Director settled down to wait for her reappearance.

Finally, the chronometer on the wall showed 1800. Jannine did not come back. At 1830 Rhys began to fidget. At 1840 he began to give nonsensical orders. Now Dugal was worried. The Shuttle used so much power that it could remain in operation for only two hours. After that a shutdown of two days was necessary for rewinding and readjustments in the coils. And if the Shuttle was strained past its two-hour limit—

By 1855 Rhys had to be forcibly restrained from trying to plunge through the charged netting in search of Jannine.

At 1900 Dugal shut off the power. Jannine had not returned.

Rhys was wild with anxiety. He grabbed Dugal by the shoulder and spun him around. "What are you doing?" His voice was high-pitched and unnatural.

"If we keep it on any longer we'll burn it out—"

"Turn it back on!"

"I can't, sir! It won't stand the load!"

Rhys' face was contorted with fear. "Jannine may be hunting for

the stasis right now! She may be in danger! Turn it on, I say!"

"It will do no good, Rhys! The machine won't take it—"

The words were cut short by Rhys' fist crashing into his mouth. The Techman dropped without a sound. Rhys clutched at the main power switch and closed it. The wire netting began to glow again. The relays chattered. Rhys stared at the empty platform helplessly.

"Where are you, Jannine? Come back! Come back, do you hear me?"

His words echoed hollowly in the small room. Then the relays gave up under the merciless overload; there was a flash of blue flame and the wire netting melted into glowing slag. There was the smell of ozone in the air, and no sound but Rhys' frightened mumbling.

"There is nothing so frightening as the concept of inevitability—"

Toran Long, Philosophical Mores, N'york Guild, 3.50 Cr.

It was a red-eyed and terrified Rhys who met Torres at the Skyport. As soon as they were in an aircar rushing toward the Institute buildings, he told Torres what had happened—haltingly, almost blubbering with the fear he felt for Jannine. He saw Torres blanch, and he rushed on with his panicky speculations.

Torres gave him a scathing look, and the Director bit his lips and did not speak again until they were alone in his luxurious office.

"What are we going to do, Mikal?" He worked his mouth nervously. "What's happened to her? *What?*"

The archeologist spoke with a cold and intense fury.

"You unutterably stupid bungler! Why do you think I sent you that message? You *fool!*"

"But I . . . I thought—"

"*You thought?* Why incompetent nincompoop, you never had a thought in your life! Now it's too late—"

There was blind panic in the other man's eyes. "What did you say? Too late—"

"The Shuttle is gone. It will take months, maybe years to rebuild! And then it will be too late." He softened suddenly before the pain in Rhys' face. Opening his pocket pouch, he brought forth two sheets of transparent plastic. Sealed inside were two tattered sheets of paper, creased and yellow with centuries of age. He laid them on the desk before Rhys.

"Rhys, when I sent you that message, I had just found these, and I thought there might be something wrong with Jannine. But on the way here I integrated the missing factors and found out a thing or two. I was wrong. Jannine didn't need psychoing. It was something else. It was the Twentieth Century — the *Age of Unreason.*

"You see, Rhys, out of all the aeons of man's history, *that* is the only age into which temporal penetration with our methods is not feasible. Dangerous, I should say At any time before then, a Temporal Agent could be accepted as a

divine manifestation . . . a . . . a spirit . . . a nymph . . driad . . . goddess . . . what you will. And from the Twenty-first Century on, science had advanced sufficiently for the idea of time travel to be acceptable. It was a brutish time. And of all the eras of earth's history, you and Jannine picked the very worst in which to seek your cultural knicknacks. The very worst."

"What are you trying to tell me?"

"Jannine isn't coming back, Loren," Torres said gently. "Read." He indicated the old papers.

The language was archaic and the small close lines of type seemed to dance before his eyes. He made them out with difficulty, his lips moving soundlessly.

"News Item: Washington, July 3, 1947: A scantily clad young woman was arrested today as she entered the rotunda of the Capitol building. Police have indicated to the FBI that according to her own admission, she was seeking government documents. She gave her name as Jannine Rhys, although FBI agents are not satisfied that it is not an alias. Police headquarters sources say that Miss Rhys is under suspicion of being an agent of a foreign power seeking A-bomb information, although her startling costume or lack—" The rest of the page was gone. Rhys felt an icy needle of fear in his vitals. He looked questioningly at Torres, but the archeologist only indicated the second sheet.

It was dated August 1949 in a styloed notation in Torres' handwriting.

" . . . she will be remembered as the mysterious girl who was captured in Washington trying to steal the display copy of the Declaration of Independence from the rotunda of the Capitol building. When arrested, she was barefooted and almost completely nude. She was investigated by the FBI for several months, being under suspicion of espionage. Later she was turned over to the staff of the Holyrood for treatments. In the two years she remained at Holyrood, she never once wavered in the strange delusion that she was a visitor in our time from the far future—even continuing the odd form of speech that was part of her fantasy. She was desperately unhappy at being forced to wear woolen clothes, and the staff was never able to force her to wear shoes. She remained strikingly beautiful, living her strange masquerade until her death—"

Death!

"—until her death under insulin shock therapy which was to have returned her to—"

That was all.

"I found those in a Time Capsule." Torres was saying.

Rhys felt the room swaying. "This . . . this . . . place . . .this Holyrood . . . what—"

Torres nodded He didn't want to say it, but the words came unbidden to his lips. It was cruel, but inevitable.

"A madhouse," he finished quietly.

THE END.

BY A.E. VAN VOGT

THE BARBARIAN

The Empire could handle enemies it understood. But the Barbarian was something the Child of the Gods wasn't properly prepared for—the Empire troops didn't know how to meet him—

Illustrated by Orban

The only warning was a steely glinting of metal in the early morning sky.

The invaders swooped down on the city of Linn in three hundred spaceships. There must have been advance spying, for they landed in force at the gates that were heavily guarded and at the main troop barracks inside the city.

From each ship debouched two hundred odd men.

"Sixty thousand soldiers!" said Lord Adviser Tews after he had studied the reports.

He issued instructions for the defense of the palace, and sent a carrier pigeon to the three legions encamped outside the city ordering two of them to attack when ready. And then he sat pale but composed watching the spectacle from a window which overlooked the hazy vastness of Linn proper.

Everything was vague and unreal. Most of the invading ships had dis-

appeared behind large buildings. A few lay in the open, but they looked dead. It was hard to grasp that vicious fighting was going on in their vicinity.

At nine o'clock, a messenger arrived from the Lady Lydia, Tews' aging mother:

> Dear Son:
> Have you any news? Who is attacking us? Is it a limited assault, or an invasion of the empire? Have you contacted Clane?
>
> L.

The first prisoner was brought in while Tews was scowling over the unpalatable suggestion that he seek the advice of his mutation cousin. The prisoner, a bearded giant, proudly confessed that he was from Europa, one of the moons of Jupiter, and that he feared neither man nor god.

The man's size and obvious physical prowess startled Tews. But his naive outlook on life was cheering. Subsequent prisoners had similar physical and mental characteristics. And so, long before noon, Tews had a fairly clear picture of the situation.

This was a barbarian invasion from Europa. It was obviously for loot only. And, unless he acted swiftly, Linn would be divested in a few days of treasures garnered over the centuries.

Bloodthirsty commands flowed from Tews' lips. Put all prisoners to the sword. Destroy their ships, their weapons their clothing. Leave not one vestige of their presence to pollute the eternal city.

The morning ran its slow course. Tews considered making an inspection of the city escorted by the palace cavalry. But abandoned the plan when he realized it would be impossible for commanders to send him reports if he was on the move.

For the same reason he could not transfer his headquarters to a less clearly marked building.

Just before noon, the relieving report arrived that two of three camp legions were attacking in force at the main gates.

The news steadied him. He began to think in terms of broader, more basic information about what had happened. He sat somber while the court historian delivered a brief lecture on Europa.

The amazing thing to Tews was how little was known about that remote moon of Jupiter. It had been inhabited from legendary times by fiercely quarreling tribes. Its vast atmosphere was said to have been created artificially with the help of the atom gods by the scientists of the golden age. And, like all the artificial atmospheres, it contained a high proportion of the gas, teneol, which admitted sunlight, but did not allow heat to escape into space.

Starting about five years before, travelers had begun to bring out reports of a leader named Czinczar who was ruthlessly welding all the hating factions of the planet into one nation.

Czinczar. The name had a sinister rhythm to it, a ring of leashed violence, a harsh, metallike tintin-

nabulation. If such a man and his followers escaped with even a fraction of the portable wealth of Linn, the inhabited solar system would echo with the exploit. The government of Lord Adviser Tews might tumble like a house of cards.

Tews had been hesitating. There was a plan in his mind that would work better if carried out in the dead of night. But that meant giving the attackers precious extra hours for loot.

He decided not to wait, but dispatched a command to the third—still unengaged—camp legion to enter the tunnel that led into the Central Palace.

As a precaution, and with the hope of distracting the enemy leader, he sent a message to Czinczar in the care of a captured barbarian officer. In it he pointed out the foolishness of an attack that could only result in bloody reprisals on Europa itself, and suggested that there was still time for an honorable withdrawal.

There was only one thing wrong with all these schemings. Czinczar had concentrated a large force of his own for the purpose of capturing the Imperial party. And had held back in the hope that he would learn definitely whether or not the Lord Adviser was inside the palace.

The released prisoner, who delivered Tews' message, established his presence inside.

The attack in force that followed captured the Central Palace and everyone in it, and surprised the legionnaires who were beginning to emerge from the secret passageway. Czinczar's men poured all the oil in the large palace tanks into the downward sloping passageway, and set it afire.

Thus died an entire legion of men.

That night a hundred reserve barbarian spaceships landed behind the Linnan soldiers besieging the gates. And in the morning, when the barbarians inside the city launched an attack, the two remaining legions were cut to pieces.

Of these events the Lord Adviser Tews knew nothing. His skull had been turned over the previous day to Czinczar's favorite goldsmith, to be plated with Linnan gold, and shaped into a goblet to celebrate the greatest victory of the century.

To Lord Clane Linn, going over his accounts on his country estate, the news of the fall of Linn came as a special shock.

With unimportant exceptions, all his atomic material was in Linn.

He dismissed the messenger, who had rashly shouted the news as he entered the door of the accounting department. And then sat at his desk—and realized that he had better accept for the time being the figures of his slave bookkeepers on the condition of the estate.

As he glanced around the room after announcing the postponement, it seemed to him that at least one of the slaves showed visible relief.

He did not delay, but called the man before him instantly. He had an inexorable system in dealing with slaves, a system inherited from his long dead mentor, Joaquin, along with the estate itself. Integrity,

hard work, loyalty, and a positive attitude produced better conditions, shorter working hours, more freedom of action, after thirty the right to marry, after forty legal freedom.

Laziness and other negative attitudes such as cheating were punished by a set pattern of demotions.

Clane could not even imagine a better system. And now, in spite of his personal anxieties, he carried out the precept of Joaquin as it applied to a situation where no immediate evidence was available. He told the man, Oorag, what had aroused his suspicions, and asked him if they were justified.

"If you are guilty and confess," he said, "you will receive only one demotion. If you do not confess and you are later proven guilty, there will be three demotions, which means physical labor, as you know."

The slave, a big man, shrugged, and said with a sneer:

"By the time Czinczar is finished with you Linnans, you will be working for me."

"Field labor," said Clane curtly, "for three months, ten hours a day."

He was astonished. Again and again, he had noticed this self-destructive instinct in people. Men and women in the highest and lowest walks of life yielded to the instinct to say something devastating for the sake of a momentary defiance or thrill of superiority.

As the slave was led out by guards, he shouted a final insult over his shoulder:

"You wretched mutation, you'll be where you belong when Czinczar gets here."

Clane forbore an answer. He considered it doubtful that the new conqueror had been selected by fate to punish all the evildoers of Linn according to their desserts. It would take too long. He put the thought out of his mind, and walked to the doorway. There he paused, and faced the dozen trusted slaves who sat at their various desks.

"Do nothing rash," he said slowly in a clear voice, "any of you. If you harbor emotions similar to those expressed by Oorag, restrain yourselves. The fall of one city in a surprise attack is meaningless."

He hesitated. He was, he realized, appealing to their cautious instincts, but his reason told him that in a great crisis men did not always consider all the potentialities.

"I am aware," he said finally, "there is no great pleasure in being a slave, though it has advantages —economic security, free craft training. But Oorag's wild words are a proof that, if young slaves were free to do as they pleased, they would constitute a jarring if not revolutionary factor in the community. It is unfortunately true that people of different races can only gradually learn to live together."

He went out, dissatisfied with his argument, but unable to see the flaw in it, if there was one.

He had no doubt whatsoever that here in this defiance of Oorag, the whole problem of a slave empire had shown itself in miniature. If Czinczar were to conquer any important portion of Earth, a slave uprising would follow automatically.

There were too many slaves, far too many for safety, in the Linnan empire.

Outside, he saw his first refugees. They were coming down near the main granaries in a variety of colorful skyscooters.

Clane watched them for a moment, trying to picture their departure from Linn. The amazing thing was that they had waited till the forenoon of the second day. People must simply have refused to believe that the city was in danger, though, of course, early fugitives could have fled in different directions. And so not come near the estate.

Clane emerged decisively out of his reverie. He called a slave, and dispatched him to the scene of the arrivals with a command to his personal guards:

"Tell these people who have rapid transportation to keep moving. Here, eighty miles from Linn, we shall take care only of the footweary."

Briskly now, he went into his official residence, and called the commanding officer of his troops.

"I want volunteers," he explained, "particularly men with strong religious beliefs, who on this second night after the invasion are prepared to fly into Linn and remove all the transportable equipment from my laboratory."

His plan, as he outlined it finally to some forty volunteers, was simplicity itself. In the confusion of taking over a vast city, it would probably be several days before the barbarian army would actually occupy all the important residences. Particularly, on these early days, they might miss a house situated, as was his, behind a barrier of trees.

If by some unfortunate chance it was already occupied, it would probably be so loosely held that bold men could easily kill every alien on the premises, and so accomplish their purpose.

Clane hoped so, violently.

"I want to impress upon you," he said, "the importance of this task. As all of you know, I am a member of the temple hierarchy. I have been intrusted with sacred god metals and sacred equipment, including material taken from the very homes of the gods.

"It would be a disaster if these precious relics were to fall into unclean hands. I, therefore, charge you that, if you should by some mischance be captured, do not reveal the real purpose of your presence. Say that you came to rescue your owner's private property. Even admit that you were very foolish to sacrifice yourself for such a reason."

Clane finished: "And finally," he said, "no matter what time of the night you return, I wish to be awakened immediately."

When they had gone out to prepare for the mission, Clane dispatched one of his private spaceships to the nearby city of Goram, and asked the commander there, a friend of his, what kind of counteraction was being prepared against the invader.

"Are the authorities in the cities and towns," he asked, "showing that

they understand the patterns of action required of them in a major emergency? Or must the old law be explained to them from the beginning?"

The answer arrived in the shortest possible time, something under forty minutes. The general placed his forces at Clane's command, and advised that he had dispatched messengers to every major city on earth, in the name of "his excellency, Lord Clane Linn, ranking survivor on Earth of the noble Tews, the late Lord Adviser, who perished at the head of his troops, defending the city of Linn from the foul and murderous surprise attack launched by a barbarian horde of beastlike men, who seek to destroy the fairest civilization that has ever existed."

There was more in the same vein, but it was not the excess of verbiage that startled Clane. It was the offer itself, and the implications. *In his name*, an army was being organized.

He had from childhood taken it for granted that soldiers regarded mutations as bad luck. Even the presence of a mutation on a field, it was said, could demoralize entire legions.

After rereading the message, he walked slowly to the full length mirror in the adjoining bathroom, and stared at his image.

He was dressed in the fairly presentable reading gown of a temple scientist. Like all his temple clothing, the cloth folds of this concealed his "differences" from casual view. An observer would have to be very acute to see how carefully the cloak was drawn around his neck, and how tightly the arm ends were tied together at his wrists.

It would take three months to advise Lord Jerrin on Venus, and four to reach Lord Draid on Mars, both planets being near the far side of the Sun from Earth. It would require almost, though not quite, twice as long to receive back a message from them.

Only a member of the ruling family could possibly win the support of the diversified elements of the empire. Of the Lord Adviser's immediate family, there was the venerable Lady Lydia—too old; and there was Lord Clane, younger brother of Jerrin, grandson of the late Lord Leader.

For not less than six months accordingly he could be the legitimate Lord Leader of Linn.

The afternoon of that second day of the invasion waned slowly. Great ships began to arrive, bringing soldiers. By dusk, more than a thousand men were encamped along the road to the city Linn, and by the riverside. Darting small craft and wary full-sized spaceships floated overhead, and foot patrols were out, guarding all the approaches to the estate.

The roads themselves were virtually deserted. It was too soon for the mobs from Linn, which air-scooter scouts reported were fleeing the captured city by the gates that, at mid-afternoon, were still open.

During the last hour before dark, the air patrols reported that the gates were being shut one by one. And that the stream of refugees was dwindling to a trickle near the darkening city.

All through that last hour, the sky was free of scooters transporting refugees.

It was clear that the people who could afford the costly machines were either already safe, or had waited too long, possibly in the hope of succoring some absent member of the family.

At midnight, the volunteers departed on their dangerous mission in ten scooters and one spaceship. As a first gesture of his new authority, Clane augmented their forces by adding a hundred soldiers from the regular army.

He watched the shadowy ships depart, then hurried to attend a meeting of those general officers who had had time to arrive. A dozen men climbed to their feet as he entered. They saluted, then stood at attention.

Clane stopped short. He had intended to be calm, matter-of-fact, pretend even to himself that what was happening was natural.

The feeling wasn't like that. An emotion came, familiar but terrify-

ing. He could feel it tangling up the remoter reflexes of his nervous system as of old, the beginning of the dangerous childish panic, product of his early, horrible days as a tormented mutation.

The muscles of his face worked. Three times he swallowed hard. Then, with a stiff gesture, he returned the salute. And, walking hastily to the head of the table, sat down.

The acting Lord Leader of Linn was in conference with his general staff.

Clane waited till they had seated themselves, then asked for brief reports as to available troops. He noted down the figures given by each man for his province, and at the end added up the columns.

"With four provinces still to be heard from," he announced, "we have a total of eighteen thousand trained soldiers, six thousand partly trained reserves, and some five hundred thousand able-bodied civilians. The—"

He stopped. The confidence went out of him. "Is that all?" he asked sharply.

"Your excellency," said his friend, Morkid, "the Linnan empire maintains normally a standing army of one million men. On Earth by far the greatest forces were stationed in or near the city of Linn, and they have been annihilated. Some four hundred thousand men are still on Venus, and slightly more than two hundred thousand on Mars.

Clane, who had been mentally adding up the figures given, said quickly:

"That doesn't add up to a million men."

Morkid nodded, gravely. "For the first time in years, the army is understrength. The conquest of Venus seemed to eliminate all potential enemies of Linn, and Lord Adviser Tews considered it a good time to economize."

"I see," said Clane.

He felt pale and bloodless, like a man who has suddenly discovered that he cannot walk by himself.

Lydia climbed heavily out of her sedan chair, conscious of how old and unattractive she must seem to the grinning barbarians in the courtyard. She didn't let it worry her too much. She had been old a long time now, and her image in a mirror no longer shocked her. The important thing was that her request for an interview had been granted by Czinczar after she had, at his insistence, withdrawn the proviso that she be given a safe conduct.

The old woman smiled mirthlessly. She no longer valued highly the combination of skin and bones that was her body. But there was exhilaration to the realization that she was probably going to her death. Despite her age, and some self-disgust, she felt reluctant to accept oblivion. But Clane had asked her to take the risk.

It vaguely amazed Lydia that the idea of the mutation holding the Lord Leadership did not dismay her

any more. She had her own private reasons for believing Clane capable.

She walked slowly along the familiar hallways, through the gleaming archways and across rooms that glittered with the treasure of the Linn family. Everywhere were the big, bearded young men who had come from far Europa to conquer an empire about which they could only have heard by hearsay. Looking at them, she felt justified in all the pitiless actions she had taken in her day. They were, it seemed to the grim old woman, living personifications of the chaos that she had fought against all her life.

As she entered the throne room, the darker thoughts faded from her mind. She glanced around with sharp eyes for the mysterious leader.

There was no one on or near the throne.

Groups of men stood around talking. In one of the groups was a tall, graceful; young man, different from all the others in the room. They were bearded. He was clean shaven.

He saw her, and stopped listening to what one of his companions was saying, stopped so noticeably that a silence fell on the group.

The silence communicated itself to other groups. After not more than a minute, the roomful of men had faced about and was staring at her, waiting for their commander to speak.

Lydia waited also, examining him swiftly. Czinczar was not a handsome man, but he had an appearance of strength, always a form of good looks.

And yet, it was not enough. This barbarian world was full of strong-looking men. Lydia, who had expected outstanding qualities, was puzzled.

His face was rather sensitive than brutal, which was unusual. But still not enough to account for the fact that he was absolute lord of an enormous undisciplined horde.

The great man came forward. "Lady," he said, "you have asked to see me."

And then she knew his power. In all her long life, she had never heard a baritone voice so resonant, so wonderfully beautiful, so assured of command.

It changed him. She realized suddenly that she had been mistaken about his looks. She had sought normal clean-cut handsomeness.

This man was beautiful.

The first fear came to her. A voice like that, a personality . . . like that.

She had a vision of this man persuading the Linnan empire to do his will. Mobs hypnotized. The greatest men bewitched.

She broke the spell with an effort of will. She said:

"You are Czinczar?"

"I am Czinczar."

The definite identification gave Lydia another though briefer, pause. But this time she recovered more swiftly. And this time, too, her recovery was complete.

Her eyes narrowed. She stared

at the great man with a developing hostility.

"I can see," she said acridly, "that my purpose in coming to see you is going to fail."

"Naturally." Czinczar inclined his head, shrugged.

He did not ask her what was her purpose. He seemed incurious. He stood politely, waiting for her to finish what she had to say.

"Until I saw you," said Lydia grimly, "I took it for granted that you were an astute general. Now, I see that you consider yourself a man of destiny. I can already see you being lowered into your grave."

There was an angry murmur from the other men in the room. Czinczar waved them into silence.

"Madam," he said, "such remarks are offensive to my officers. State your case, and then I will decide what to do with you."

Lydia nodded, but she noted that he did not say that he was offended. She sighed inwardly. She had her mental picture now of this man, and it depressed her. All through known history these natural leaders had been spewed up by the inarticulate masses. They had a will in them to rule or die. But the fact that they frequently died young made no great difference. Their impact on their times was colossal.

Such a man could, even in his death throes, drag long established dynasties with him.

Already, he had killed the legal ruler of Linn, and struck a staggering blow at the heart of the empire. By a military freak, it was true—but history accepted such accidents without a qualm.

Lydia said quietly, "I shall be brief, since you are no doubt planning high policy and further military campaigns. I have come here at the request of my grandson, Lord Clane Linn."

"The mutation!" Czinczar nodded. His remark was noncommittal, an identification not a comment.

Lydia felt an inward shock that Czinczar's knowledge of the ruling faction should extend to Clane, who had tried to keep himself in the background of Linnan life.

She dared not pause to consider the potentialities. She went on quietly:

"Lord Clane is a temple scientist, and, as such, he has for many years been engaged in humanitarian scientific experiments. Most of his equipment, unfortunately, is here in Linn."

Lydia shrugged. "It is quite valueless to you and your men, but it would be a great loss to civilization if it was destroyed or casually removed. Lord Clane therefore requests that you permit him to send slaves to his town house to remove these scientific instruments to his country estate. In return—"

"Yes," echoed Czinczar, "in return—"

His tone was ever so faintly derisive; and Lydia had a sudden realization that he was playing with her. It was not a possibility that she could pay any attention to.

"In return," she said, "he will pay you in precious metals and

jewels any reasonable price which you care to name."

Having finished, she took a deep breath. And waited.

There was a thoughtful expression on the barbarian leader's face.

"I have heard," he said, "of Lord Clane's experiments with the so-called"—he hesitated—"god metals of Linn. Very curious stories, some of them; and as soon as I am free from my military duties I intend to examine this laboratory with my own eyes.

"You may tell your grandson," he went on with a tone of finality, "that his little scheme to retrieve the greatest treasures in the entire Linnan empire was hopeless from the beginning. Five spaceships descended in the first few minutes of the attack on the estate of Lord Clane, to insure that the mysterious weapons there were not used against my invading fleet, and I consider it a great misfortune that he himself was absent in the country at the time.

"You may tell him that we were not caught by surprise by his midnight attempt two days ago to remove the equipment, and that his worst fears as to its fate are justified."

He finished, "It is a great relief to know that most of his equipment is safely in our hands."

Lydia said nothing. The phrase, "You may tell him," had had a profound chemical effect on her body. She hadn't realized she was so tense. It seemed to her that, if she spoke, she would reveal her own tremendous personal relief.

"*You may tell him*—" There could be only one interpretation. She was going to be allowed to depart.

Once more she waited

Czinczar walked forward until he was standing directly in front of her. Something of his barbarous origin, so carefully suppressed until now, came into his manner. A hint of sneer, the contempt of a physically strong man for decadence, a feeling of genuine basic superiority to the refinement that was in Lydia. When he spoke, he showed that he was consciously aware that he was granting mercy:

"Old woman," he said, "I am letting you go because you did me a great favor a few years ago, when you maneuvered your son, Lord Tews, into the, what did he call it, Lord Advisership. That move, and that alone, gave me the chance I needed to make my attack on the vast Linnan empire."

He smiled. "You may depart, bearing that thought in mind."

Long ago, Lydia had condemned the sentimental action that had brought Tews into supreme power. But it was a different matter to realize that, far out in interplanetary space, a man had analyzed the move as a major Linnan disaster.

She went out without another word.

Czinczar slowly climbed the hill leading up to the low, ugly fence that fronted Lord Clane's town house. He paused at the fence,

recognized the temple building material of which it was composed —and then walked on thoughtfully.

With the same narrow-eyed interest a few minutes later, he stared at the gushing fountain of boiling water.

He beckoned finally the engineer who had directed the construction of the spaceships that had brought his army to Earth.

"How does it work?"

The designer examined the base of the fountain. He was in no hurry, a big fattish man with a reputation for telling jokes so coarse that strong men winced with shame. He had already set up house in one of the great palaces with three Linnan girls as mistresses and a hundred Linnan men and women as slaves. He was a happy man, with little personal conceit and very little pride as yet to restrain his movements.

He located the opening into the fountain, and knelt in the dirt like any worker. In that, however, he was not unique. Czinczar knelt beside him, little realizing how his actions shocked the high born Linnans who belonged to his personal slave retinue.

The two men peered into the gloom.

"Temple building material," said Meewan, the designer.

Czinczar nodded. They climbed to their feet without further comment, for these were matters which they had discussed at length over a period of several years.

At the house, a few minutes later, the leader and his henchman both lifted the heavy draperies that covered the walls of a corridor leading into the main laboratory. Like the fence outside, the walls were warm as from some inner heat.

Temple building material! Once again, there was no comment passed between them. They walked on into the laboratory proper; and now they looked at each other in amazement.

The room had been noticeably enlarged from its original size. A great section had been torn out of one wall, and the gap, although it was completely filled in, was still rough and unfinished.

But that was only the environment. On almost every square yard of the vast new floor were machines opaque and machines transparent, machines big and small, some apparently complete, others unmistakably mere fragments.

For a moment there was a distinct sense of too much to see. Czinczar walked forward speculatively, glancing at several of the transparent articles with an eye that tried to skim the essentials of shape and inner design.

At no time, during those first moments, did he have any intention of pausing for a detailed examination.

And then, out of the corner of his eye, he caught a movement.

A glow. He bent down, and peered into a long partly transparent metal case, roughly shaped like a coffin, even as to the colorful and costly looking lining. The inside, however, curved down to form a narrow channel.

Along this channel rolled a ball of light.

It turned over sedately, taking approximately one minute to cover the distance to the far side. With the same lack of haste, it paused, seemed to meditate on its next action, and then, with immense deliberation began its return journey.

The very meaninglessness of the movement fascinated Czinczar. He extended his hand gingerly to within an inch of the ball. Nothing happened. He drew back, and pursed his lips. In spite of his attack on Linn, he was not a man who took risks.

He beckoned towards a guard. "Bring a slave," he said.

Under his direction a former

Linnan nobleman, perspiring from every pore, extended his finger and touched the moving ball.

His finger went in as if there was nothing there.

He drew back, startled. But the inexorable Czinczar was not through with him. Once more the reluctant, though no longer quite so fearful, finger penetrated the moving ball.

The ball rolled into it, through it, beyond it.

Czinczar motioned the slave aside, and stood looking at him thoughtfully. There must have been something of his purpose in his face, for the man gave forth a low cry of horror:

"Master, I understand nothing of what I have seen. Nothing. Nothing."

"Kill him!" said Czinczar.

He turned, scowling, back to the machine. "There must be," he said, and there was a stubborn note in his glorious voice, "some reason for its movements, for—its existence."

Half an hour later, he was still examining it.

There was an old saying in the Linnan army to the effect that, during his first month, a trainee, if put into battle, caused the death of his trained companions. During the second month, he hindered retreats made necessary by his presence. And during the third month he was just good enough to get himself killed in the first engagement.

Clane, watching a group of trainees after several weeks of drilling, experienced all the agony of realizing how true the adage was.

Learning to fire a bow effectively required complex integration of mind and body. Infighting with swords had to include the capacity for co-operating with companions. And effective spear fighting was an art in itself.

The plan he outlined that night to the full general staff was an attempt to cover up against the weakness. It was a frank determination to use unfit men as first-line defense troops.

He put in a word for the unfit: "Do not overexercise them. Get them out into the open air, and simply teach them the first elements of how to use weapons. First, bows and arrows, then spears, and finally swords."

He paused, and, looking around the table, mentally measured the ability of the audience to assess his next statement. He said slowly:

"If two months from now our position is as desperate as I anticipate, there is one other possibility which I will then explore. It has to do with one of several machines of the gods which I removed last year from a pit of the gods, and which Czinczar captured when he effectively occupied my town. But nothing can be done for two months."

After the meeting, long into the night, he examined reports on the cities of Nouris and Gulf, which had fallen virtually without a fight. As the barbarians attacked, the slaves simply rose up and murdered their masters. A supplementary general staff report recom-

mended mass execution for all able-bodied slaves.

The uneasy Clane took that problem to bed with him.

FREEDOM FOR LOYAL SERVANTS

By order of his excellency, the acting Lord Leader of Linn, temple scientist, beloved of the Atomic Gods themselves, it is hereby commanded, and so it shall be forevermore:

GREETINGS to all those good men and women who have quietly and efficiently served the empire in atonement for sins of leaders who rashly led them into hopeless wars against the god-protected Linnan empire—here is the chance for complete freedom which you have earned by your actions and attitudes during past years.

The empire has been attacked by a cruel and barbarous invader. His reign of terror cannot but be temporary, for invincible forces are gathering against him. An army of a million men is on the way from Mars and Venus, and here on Earth irresistible forces totaling more than two million men are already organizing for battle.

The enemy himself numbers less than sixty thousand soldiers. To this small army, which gained its initial victory by a surprise and base attack, a few foolish men and women have rashly attached themselves. All the women unless they are convicted of major crimes, will be spared. For the men who have already gone over to the enemy, there is but one hope: Escape immediately from the barbarian enemy, and REPORT TO THE CONCENTRATION CAMPS listed at the bottom of this proclamation. There will be no guards at the camps, but weekly roll calls will be made. And every man whose name appears regularly on these rolls will be granted full freedom when the enemy is defeated.

For hardened recalcitrants, the penalty is death.

To those men and women still loyally serving at their appointed tasks, I, Lord Clane, acting Lord Leader of Linn, give the following commands:

All women and children will remain at their present residences, continuing to serve as in the past.

All men report to their masters, and say, "It is my intention to take advantage of the offer of Lord Clane. Give me a week's food, so that I, too, may report to a concentration camp."

Having done this, and having received the food, leave at once. DO NOT DELAY A SINGLE HOUR.

If for some reason your master is not at home, take the food and go without permission. No one will hinder you in your departure from the city.

Any man to whom this order applies, who is found lurking within any city or town twenty-four hours after this proclamation is posted, will be suspected of treasonable intent.

The penalty is death.

Any man, who after one week, is found within a fifty-mile radius of a city, will be suspected of treasonable intent.

The penalty is death.

To save yourself, go to a concentration camp, and appear regularly for roll call. If the barbarians attack your camp, scatter into the forests and hills and hide, or go to another camp.

Adequate food rations will be supplied all camps.

All those of proven loyalty will receive freedom when the war is over. They will immediately have the right to marry. Settlement land will be opened up. After five years, citizenship rights, granted alien immigrants, will be available on application.

After three years, new citizens may own unpaid servants.

BE WISE—BE SAFE—BE FREE

It was a document that had its weak points. But Clane spent most of one day arguing its merits to a group of doubtful officers. He pointed out that it would be im-

possible to keep secret a general order for mass execution. A majority of the slaves would escape, and then they would really be dangerous.

He admitted the proclamation was full of lies. A million slaves in Linn alone had gone over to Czinczar, many of them highly trained soldiers. Czinczar could use them to garrison any city he might capture, and thus have his own army free for battle. It was Morkid, sardonic and scathing, who ended the argument late in the afternoon.

"Gentlemen," he said, "you do not seem to be aware that our commander-in-chief, the acting Lord Leader of Linn, has at one stroke cut through all our illusions and false hopes, and penetrated straight to the roots of the situation in which we find ourselves. What is clear by the very nature of our discussion is that we have no choice."

His voice went up: "In this period when disaster is so imminent, we are fortunate in having as our leader a genius of the first rank, who has already set us on the only military path that can lead to victory.

"Gentlemen"—"his voice rang with the tribute—"I give you Lord Clane Linn, acting Lord Leader of Linn."

The clapping lasted for five minutes.

Clane watched the battle for Goram from a patrol craft, that darted from strong point to strong point. Enemy squadrons tried again and again to close in on him, but his own machine was faster and more maneuverable.

The familiar trick of getting above him was tried, an old device in patrol craft and spaceship fighting. But the expected energy flow upward did not take place. His small vessel did not even sag, which was normally the minimum reaction when two sources of atomic energy operated in a gravity line.

The efforts worried Clane. Czinczar was, of course, aware by this time that his enemy knew more about the metals of the gods than he or his technicians. But it would be unfortunate if they should conclude from the actions of this one craft that Clane himself was inside.

He wanted to see this battle.

In spite of everything, minute by minute, he saw it.

The defense was tough, tougher than he had anticipated from the fact that four more cities had fallen in the past four weeks.

The unfit were fighting grimly for their lives. Arrows took a toll of the attackers. Spears, awkwardly but desperately manipulated, inflicted wounds and sometimes death.

The sword fighting stage was the worst. The muscular and powerful barbarians, once they penetrated the weapons that could attack them from a distance, made short work of their weaker adversaries.

The first line was down, devastated, defeated. The second line battle began. Barbarian reserves came forward, and were met by

waves of arrows that darkened the sky—and took their toll when they struck the advancing groups of men.

Hoarse cries of pain, curses, the shrieks of the desperately wounded, the agonized horror of Linnans suddenly cut off, and doomed rose up to the ears of those in the darting small craft.

The defenders strove to stay together. That was a part of their instructions. Retreat slowly to the central squares—which were strongly held against a surprise rear attack. Retreat, and at the last minute spaceships would land and rescue the hard pressed, but theoretically still intact army of what had once been able-bodied civilians.

After a month and a half of training, they were too valuable to sacrifice in a last ditch fight.

As it was, their dogged resistance was shaping the pattern of the war. Surely, Czinczar, counting his men after each battle, must already be having his own private doubts. His army as a whole, augmented by the unrepentant among the slaves, was increasing daily. But the larger the army grew the smaller was his chance of controlling it.

But there was no doubt about this battle, or this city. As the dark tide of night slipped in from the east, victory fires began to burn in all the important streets. The smoke wreathed into the sky and blood-red flames licked up into the blackness.

The Linnans below, at this very moment enduring the beginning of a barbarian occupation, would not be in a humor to appreciate that their grudgingly accepted defeat represented a possible turning point in the war.

The time had come to decide when and where and under what conditions the main Linnan force would be thrown into a decisive battle for the control of the planet.

And there was another decision, too, involving an immensely risky attempt to get near a certain atomic machine. Clane shifted uneasily in his seat, and drew his cloak more tightly around his shoulders.

He had no illusions about what one easily killable man could do even with phenomenal weapons. Besides, he had received a disturbing note from Czinczar, which contained only one sentence, a question:

"Have you ever wondered, my Lord Clane, how the civilization of the golden age was so *completely* destroyed?"

It was a problem about which the mutation, Clane, had pondered many times.

But it had never occurred to him that the answer might be known to a barbarian from a remote moon of Jupiter.

The moment the news arrived, Czinczar headed for Linn. He was met on the roof of the central palace by Meewan. The big man had a smile on his plump, good-fellow face.

"Your theory was right," he said admiringly. "You thought he would take a chance at the critical period of the invasion. And he arrived this morning."

"Tell me exactly how you accepted his services."

The golden voice spoke softly. The strange face was thoughtful as the other man gave his detailed account. There seemed no end to his interest. When the story was finished, he asked question after question. Each answer seemed merely to stimulate new questions. Meewan said finally, querulously:

"Your excellency, what are you doubtful about?"

That stopped him, for he had not realized how tense he was. After all, he told himself, the situation was simple enough. He had issued an open invitation for temple scientists to come and take care of "some god metal relics" which had fallen into possession of the conquerors. It was a cleverly worded request, designed to win general approval from the defeated even as it drew *the* temple scientist to his own undoing.

Its only stipulation, very guardedly worded, was that in return for the privilege of sharing the "safeguarding of the relics", experiments should be continued as if no war was being waged.

"The gods," Czinczar had said sanctimoniously in the invitation, "are above the petty quarrels of mankind."

Apparently, at least one of its purposes was accomplished. The mutation himself had applied for the job. Czinczar meditated cautiously on tactics.

"Bring him here," he said finally. "We can't take any risks of his having established control over anything at his house. We know too little and he too much."

While he waited, he examined the rod of force—which was one of the few workable instruments that had been found in the house. He was not a man who accepted past truths as final. The fact that it had worked a week ago did not mean that it would work now.

He tested it from a great window, pointing it at the upper foliage of a nearby tree.

No sound, no visible light spewed forth—but the upper section of the tree crashed down onto a pathway below.

Czinczar experienced the satisfaction of a logical man whose logic had proved correct. It was not an uncommon satisfaction. From the early days when he had been a back country transcriber of messages to the days of his rise to power, he had taken risks which seemed necessary, no more, no less.

Even now he could not be sure that the atomic wizard, Lord Clane, would not defeat him by some decisive wile. For several minutes, he pondered that, and then ordered a box brought in from the ice room of the palace. The contents of the box had come all the way from Europa packed in ice.

He was indicating to the slaves where to place the box when an officer burst breathlessly into the throne room.

"Excellency," he cried. "Hundreds of spaceships. It's an attack."

Standing at the window a moment later, watching the ships

settling down, Czinczar realized that his hazy suspicions had been correct.

The appearance of Clane in the city was part of a planned maneuver, which would now run its deadly course.

It was a pleasure to know that Lord Clane himself was caught in a trap.

Czinczar wasted no time watching a battle which he could not hope to see from the palace in any important detail. Nor did he have the feeling Tews had had months earlier, that it was necessary for commanders to know where he was in the early stages of the engagement.

It was nice for a general to get reports, and there was a thrill in giving a "Stand fast" order to troops already fighting for their lives. But it was quite unnecessary.

Czinczar issued quick instructions about the box, and wrote a note for Meewan. Then he rode with a strong escort to the headquarters of the reserve army in the middle of the city.

The reserve contained a barbarian core, but, like the main defense forces of the city, it was overwhelmingly made up of slaves. Czinczar's arrival was greeted by a roar of excitement. The cheers did not die down until long after he had entered the building.

He talked over the situation with some of the slave officers, and found them calm and confident. According to their estimates sixty thousand Linnan soldiers had landed in the first wave. The fact that that was exactly the number of barbarians who had originally invaded the city did not seem to occur to the slaves. But the comparison struck Czinczar sharply. He wondered if it was designed to have some symbolical meaning.

The possibility made him sardonic. Not symbols but swords spoke the language of victory.

As the afternoon dragged on, the Linnan attack was being held everywhere. The box was delivered from the palace about three. It was dripping badly, and since there was no longer any immediate danger, Czinczar sent a messenger to Meewan.

At three-thirty Meewan came in grinning broadly. He was followed by slave Linnans carrying a sedan chair. In the chair, bound hand and foot, was the acting Lord Leader of Linn.

There was complete silence as the chair was set down, and the slaves withdrew.

Clane studied the barbarian leader with a genuine interest. His grandmother's opinion of the man had impressed him more than he cared to admit. The question was, could this strong-looking, fine-looking military genius be panicked into thinking that the atom gods existed? Panicked now, during the next half hour?

Fortunately, for the first time in his career as an atomic scientist, he had behind him the greatest power ever developed by the wiz-

ards of the fabulous days of the legends. He saw that the impersonal expression on the other's face was transforming into the beginning of contempt.

"By the god pits," said Czinczar in disgust, "you Linnans are all the same—weaklings every one."

Clane said nothing. He had looked often with regret into mirrors that showed him exactly what Czinczar was seeing: A slim, young man with a face that was white and womanish and . . . well, it couldn't be helped.

Czinczar's face changed again. There was suddenly irony in it.

"I am speaking," he asked politely, "to Lord Clane Linn? We have not made a mistake."

Clane couldn't let the opening pass. "No mistake," he said quietly. "I came into Linn for the sole purpose of talking to you while the battle was on. And here I am."

It must have sounded ridiculous,

coming from a man bound as he was. The near guards guffawed, and Meewan giggled. Only Czinczar showed no sign. And his marvelous voice was as steady as steel as he said:

"I have not the time to flirt with words, nor the inclination. I can see that you are counting on something to save you, and I presume it has something to do with your knowledge of atomic energy."

He fingered the rod of force suggestively. "So far as I can see, we can kill you in less than a second whenever we desire."

Clane shook his head. "You are in error. It is quite impossible for you to kill me."

There was a sound from Meewan. The engineer came forward.

"Czinczar," he said darkly, "this man is intolerable. Give me permission to slap his face, and we shall see if his atom gods protect him from indignity."

Czinczar waved him aside. But he stared down at the prisoner with eyes that were unnormally bright. The swiftness with which tension had come into the room amazed him. And, incredibly, it was the prisoner who had seized the advantage—"Impossible to kill me!" In one sentence he dared them to make the attempt.

As he stood hesitating, an officer came in with a report. Except for a tiny note, everything was favorable. The note was about prisoners: "All have been told that a great miracle will win the battle for the Linnans. I mention this for what it is worth—"

Czinczar returned to his prisoner, and there was a crinkle of frown in his forehead. He had been careful in his handling of Clane as a matter of common sense, not because he anticipated disaster. But now, quite frankly, he admitted to himself that the man was not reacting normally.

The words Clane had spoken had a ring in them, a conviction that could no longer be ignored. The purpose of his own invasion of the Linnan empire could be in danger. He said urgently:

"I have something to show you. No attempt will be made to kill you until you have seen it. For your part, do nothing hasty, take no action, whatever power you have, until you have gazed with understanding."

He was aware of Meewan giving him an astounded glance. "Power!" exclaimed the designer, and it was like a curse. "The power *he* has!"

Czinczar paid no attention. This was his own special secret, and there could be no delay.

"Guards," he said, "bring that box over here."

It was soaking wet when they brought it. It left a dirty trail of water on the priceless rug, and a pool began to accumulate immediately where it was set down.

There was a delay while sweating men pried off the top. Even the guards at far doors strained to see the contents.

A gasp of horror broke the tension of waiting.

What was inside was about eight feet long. Its width was indeter-

minable," for there seemed to be folds in its body that gave an impression of great size. It had obviously died only a short time before it was packed in the ice.

It looked fresh, almost alive.

It lay there in its case of ice, unhuman, staring with sightless, baleful eyes at the ornate ceiling.

Clane looked up finally into Czinczar's waiting eyes. He said slowly:

"Why are you showing this to me?"

"It would be a grave error," said Czinczar, "for either of us to destroy each other's armies."

"You are asking for mercy?"

That was too strong to take. The barbarian showed his teeth in a snarl. "I am asking for common sense," he said.

"It's *impossible*," said Clane. "The people must have their revenge. In victory, they will accept nothing less than your death."

The words brought an obscene curse from Meewan. "Czinczar," he shouted, "what is all this nonsense? I have never seen you like this. I follow no man who accepts defeat in advance. I'll show you what we'll do with this . . . this—"

He broke off: "Guards, put a spear into him."

Nobody moved. The soldiers looked uneasily at Czinczar, who nodded coolly.

"Go right ahead," he said. "If he can be killed, I'd like to know."

Still nobody moved. It was apparently too mild an order, or something of the leader's tension had communicated to the men. They looked at each other, and they were standing there doubtfully when Meewan snatched a sword from one of them, and turned towards the bound man.

That was as far as he got.

Where he had been was a ball of light.

"Try," came the voice of Clane, "to use the rod of force against me." A fateful pause. "Try. It won't kill you."

Czinczar raised the rod of force, and pressed the activator.

Nothing happened—Wait! The ball of light was growing brighter.

Clane's voice split the silence tantalizingly: "Do you still not believe in the gods?"

"I am surprised," said Czinczar, "that you do not fear the spread of superstition more than the spread of knowledge. We so-called barbarians," he said proudly, "despise you for your attempt to fence in the human spirit. We are free thinkers, and all your atomic energy will fail in the end to imprison us."

He shrugged. "As for your control over that ball, I do not pretend to understand it."

At last, he had shocked the mutation out of his ice-cold manner. "You actually," said Clane incredulously, "do not believe in the atom gods?"

"Guards," shouted Czinczar piercingly, "attack him from every side."

The ball of light flickered but did not seem to move.

There were no guards.

"Now do you believe?" Clane asked.

The barbarian looked haggard and old. But he shook his head.

"I have lost the war," he mumbled. "Only that I recognize. It is up to you to take up the mantle which has fallen from my shoulders."

The smaller man gazed at him wonderingly. And then, the bonds fell from him as if they did not exist. He stood up, and now that crown among all the jewels of the ages rode above his head in a matchlessly perfect rhythm with his movements.

Czinczar said stubbornly, "It would be a mistake to kill any able bodied man, slave or otherwise."

Clane said, "The gods demand absolute surrender."

Czinczar said in fury. "You fool I am offering you the solar system. Has this monster in the box not changed your mind in the slightest degree?"

"It has."

"But then—"

"I do not," said Clane, "believe in joint leadership arrangements."

A pause. Then:

"You have come far—who once used his power merely to stay alive."

"Yes," said Clane, "I have come far."

"Will you promise to try for the Lord Leadership?"

"I," Clane said, "can promise nothing."

They looked at each other, two men who almost understood each other. It was Czinczar who broke the silence:

"I make an absolute surrender," he said, "to you, and you alone, of all my forces—in the belief that you have the courage and common sense to shirk none of your new duties as Protector of the Solar System.

"It was a role," he finished somewhat unnecessarily, "that I originally intended for myself."

In a well-guarded room in a remote suburb of Linn, a core of energy rolled sedately back and forth along a narrow path. In all the solar system there was nothing else like that core. It looked small, but that was an illusion of man's senses. The books that described it, and the men who had written the books, knew but a part of its secrets.

They knew that the micro-universe inside it pulsed with a multiform of minus forces. It reacted to cosmic rays and atomic energy like some insatiable sponge. No sub-molecular energy released in its presence could escape it. And the moment it reached its own strange variation of critical mass it could start a meson chain reaction in anything it touched.

One weakness it had—and men had seized upon that in their own greedy fashion—it imitated thought. Or so it seemed.

So—it—seemed.

THE END.

THE DREAMERS

BY MICHAEL YAMIN

Illustrated by Orban

***Some** men dream of reaching the stars, the power to escape the Solar System. Some men dream of power—the power to rule. And the trouble is that angry action is so much easier for men than is the slow, hard process of thinking—*

It was strange to roam through the Station that had once echoed with all the vigorous noise of man and his machines; that had once been the spearhead of the endeavor that was to give his species its greatest, most audacious conquest, and to hear only the silence of space, accentuated by the sound of his solitary footfalls. Before, he had shouted occasionally, to break the silence that was that of the temple of aloof gods, of gods of space that had forsaken Homo sapiens; but the echoes, rushing down the steel corridors, to return, faint and fainter again, around the scarred corners, had been far worse than the hush of space. He could, in the silence, find a sort of communion with the powers of space, a resignation to the fate that had overtaken so many races before his. But the walls shone bright in places, under the lights that still burned; and the metallic gleams bit deep with the memory of the great scintillating machines of steel and glass that had fought with living power for man against the hostile Universe that

was his last frontier. Or, rather, had seemed to be!

View windows were scarce. There had been many, broad areas of invisible crystal through which the dreamers and builders and seekers for truth and the bold adventurers of space had looked with challenge at the cold, aloof, remote stars and at the vast flank of the Earth looming dark or blue-shining; dwarfing the tiny, spinning cylinder of the Outer Station that sped on its swift orbit just beyond the last tenuous streamers of atmosphere. But most of the windows looking on the worlds were broken, their bright shards littering the floors where the watchers had stood; and the turrets and blisters which had been built to accommodate them were airless, their perishable contents dessicated in the vacuum of the void, sealed off by automatic doors from the body of the Station and from the man who wandered lonely through the echoing corridors of the crowning achievement of his species. Some of the dry organic matter lying in the ruptured compartments had been his companions, his co-workers in the struggle to storm the stars, to add more knowledge and power to the store of man. He wished vaguely he were with them—but passingly, without any real emotion. He had been drained of emotion—he was a machine, a thinking robot drifting aimlessly along scarred passages, through wreckage-strewn compartments. Now he stood in the one remaining view-turret, among twisted, weapon-gripping things that had been men, and looked passionlessly at the dark cliff that was the Earth.

The darkness was unbroken now. The flares that had leaped into life at scattered points and then had faded into darkness no longer appeared. Those flares had been the light of cities exploding into incandescent vapor under the terrible temperatures and pressures of atomic bombs. He wondered vaguely who had started the war. Nobody, here on the Station, had known; possibly nobody anywhere knew. There were just the intermittent, sparkling nova that had appeared on that dark cliff on Earth, and the radio room that reported city after city off the air—forever.

The tension had grown and grown in the corridors and compartments of the Station; men had watched each other warily as they went half-heartedly about the work that had been meant to free humanity from its prison of gravity. The tension had mounted—just as it must have on Earth—and, finally, it had snapped. Then there was shooting in the Station of Space, and the roar of explosives in the echoing steel structure. He didn't know who started that, either. He remembered, as in another life, slinking, gun in hand, from compartment to compartment, from laboratory to laboratory; shooting at anonymous shapes that shot back at him, throwing the makeshift bombs someone had put together in a chemistry laboratory. Then the shots and blasts became less and less frequent, just as had the flashes

below, and now he stood alone and emotionless before the one remaining view window, and looked at the Earth.

And, as he stood there, emotion began to return.

He was an American. He remembered that. There, that blue-brown shape on Earth that came into view as the Station swung around to the sunlit side of the planet, that was America. The flashes had been very frequent there. He thought of how New York must look now, New York and Chicago and San Francisco and Cleveland and all the cities, tall and low, great and sprawling or small and quiet, where the burning flashes had appeared in the night. He thought of the broken buildings, and the trapped and burned people. His vague desire for death was gone, now. He wanted to live to see the perpetrators of this deed punished—not that there was any punishment that could even remotely repay them for their crime. But he wanted to live, and try to find one.

He smelled the air. Still good. Apparently, the automatic machines of the Station had not been harmed by the fight that had exterminated its inhabitants. The lights still burned; the atomic generator that powered the Station must still be running. It would be a long time before that needed attention, but the air purifier would have to be tended to within two weeks, and he couldn't do that himself. By that time, however, he would know his fate—surely before then, if there were any ships on Earth left capable of rising to the Station, they would be here. Somehow he knew that the ships that came would be American. Then he would be able to fight against the murderers of his nation.

He walked through the Station, purposively now, towards the space lock. He would wait there for the sharp-nosed ships that he knew would come soon. The thought of revenge exhilarated him. Death to the murderers! To the aliens who had killed his people!

But, strangely, there was no hate in him for the sprawled, international shapes that lay along the corridors—even toward those he had killed himself. Toward them, he felt only sadness—and brotherhood.

He had to wait, there by the lock, less than a day before the ships came.

He felt the vibration of the Station as the first docked, in the hollow at the great cylinder's end. There was fumbling on the other side of the lock, and for a moment he was afraid that they were going to let the air rush out of the Station, under the impression that it was empty or held by enemies. But the inner door swung safely open, and spacesuited figures came through, and froze as they saw him standing there. The spacesuits were American design.

"I'm James Curran," he babbled. "Dr. James Curran, Chemist. I'm an American. I'm the only one left. I'm an American—"

The gray-steel fittings of the lock blurred before his eyes as the figures came towards him. As they reached him, everything went dark.

Were those stars, that speckled the view before his eyes? He had always liked to look at the stars, from his earliest childhood. Here on the Station he could look at them more closely than he had ever before. They shone small and cold; steady, tiny specks of light against the silver-hazed darkness of space. Some day he would watch one swell and swell in the forward view plate of a ship. Not really a star, he thought sadly, but a planet; but some day, someone would actually watch a star grow and stand out from its fellows as first a tiny disk, then a round, bright sun that you could not look at with bare eyes. Someone would send his ship circling about the new sun to find the planets, the new lands unknown to men. That was what he, and all the other humans of this Station worked for so hard.

An interesting trail he was on now. A way to increase the energy of combustion of any molecule. If it worked, the interplanetary fuel problem would be solved, without any need to battle with the problem of applying atomic energy to a reaction engine. Fuels synthesized under the influence of certain fields —von Hohenburg had first discovered this fact—held more energy in their molecules than the same fuels made in the ordinary way. They had to stay in the fields, however, or they would simply release their energy and revert to their original form—the . . . the Nakashira field. He remembered now. He was looking for the compounds or elements for which the Nakashira effect was maximum, to try to form an explanation for the phenomenon. Could it be— No, Leblanc had tried that idea, and got nowhere—unless those observations that Spirelli had rejected as unreliable were correct after all.

Were they stars? He opened his eyes wide, trying to focus. He blinked, tried again. Suddenly everything stood out sharp and clear. They were spots where bullets had chipped the paint off a steel ceiling. He lay in a bed in a strange room, a man in uniform lounging in a chair nearby. He remembered all that had happened.

All dead. All his comrades, his co-workers—Nakashira, von Hohenburg, Leblanc, Spirelli. A deep pang of sorrow and loss pierced him, and for a moment the desire for death that had filled him when first he was left alone in the echoing Station returned.

He must have moved, or made a noise, for the man in uniform was on his feet and by the bedside. "You awake, sir? I'm ordered to take you to the general as soon as you can walk."

The general. The armed force that had landed on the Station. The Americans. Revenge for America. "Immediately," he said. "You should have woke me."

"Well, we figured you needed the rest," said the soldier. "You keeled over before you'd told us

more than your name." Curran was struggling to his feet. "Here, let me help you."

They walked down a corridor that was alive with uniformed men at urgent-seeming tasks. Curran remembered it when the silence of space filled it with echoes, and before, when all the urge of men towards the stars had culminated and combined here. It seemed different, with these silent and busy men in uniform pacing briskly along, on errands of war.

The compartment of their destination had been the office of the head of the Division of Astronomy. An aide took him from his guide, led him into the inner office immediately. Several high-ranking officers sat about the dead astronomer's desk. The one in the center, lean and hawk-faced, was introduced as Major general Coates.

"Dr. Curran," he began without ceremony, "you probably realize that we are here to convert this Station to a base from which we can operate space patrols and launch rockets at objectives on Earth."

It was designed as a base from which to operate exploring parties and launch rockets at the stars, Curran thought with bitter irony. *Revenge for America!* screamed a voice in his mind. "I understand, sir," he said.

"In doing this," the general continued, "we naturally need all the information on the structure of the Station that we can get. Unfortunately, most of those who can give us such information are dead, either on Earth or here, or are in enemy countries. You realize that every other country is an enemy." He paused, apparently for response. Curran nodded.

"Therefore, you will go with Lieutenant colonel Grimm, and tell him all you know about the details of construction and location of this Station. I realize that this is not in your field, but having lived here, you must have picked up more information about it than is available to most people elsewhere. You will tell all that you possibly can Remember, Curran, this is for America!"

"Yes, in revenge for America." said Curran almost automatically.

"Revenge—Well, yes. Yes, Curran! In revenge!"

He sat in an office with star photographs on the walls, and answered questions. Grimm was an expert questioner. His queries were designed to start Curran talking, to bring out details of construction and designs that he never knew he knew. Grimm did not let him wander from the topic on which he sought information, though. Digression to another part or function of the Station brought new guiding questions.

The Station was a great cylinder, swinging on its swift orbit about the Earth, and spinning on its axis to provide psuedogravity outwards from the center. Such stations had been described and discussed long before the first rocket had left atmosphere, and thus were nothing

new. There had even been stories written about them.

The long axis of the Station kept a steady alignment in space. This was for the benefit of the astronomers, who had their telescope at one end of the cylinder. "Inconvenient," mused Grimm. "It would have been better for our purpose if one end always pointed to the Earth, or something like that."

But when the Station was built, we weren't thinking of Earth. We were thinking of the stars.

The telescope at one end of the cylinder, mounted to counteract the Station's rapid rotation. The landing tubes at the other end, through which they received supplies from Earth and from which they hoped to launch the first interplanetary ships. That was where the Station's orbital velocity came in. Almost five miles a second, it would give the ships a tremendous boost towards the seven miles per second needed to break free from Earth. "I wish it weren't so high," said Grimm. "It'll complicate aiming the rockets."

But we weren't thinking of dropping rockets to Earth. We were going to throw them to Mars and to Venus, and beyond.

The blisters in which were the great view windows, were outside—below—the bottom level of the cylinder proper. The vacuum labs were near the outer skin, and the low-gravity labs were at the Station's axis. The other turrets were the radiation labs and the shielded low-temperature labs. "We'll convert those blister-labs into gun-turrets and rocket-launchers," mused Grimm.

And more and more, down to points of engineering detail that the chemist could not appreciate, though he could describe them. He forced himself to consider the Station as the officer did, as a fortress suspended in the sky above the Earth, to spread death and destruction across the land below. But the star photographs on the walls of the room stared out at him, and he ached inwardly at the sight of his lifelong goal. *Revenge for America,* he thought to himself, and he held his mind firmly to the task at hand. But the stars looked out reproachfully from the walls.

The inquisition seemed endless. After a while, Curran and Grimm left the office and started a tour of the Station, to refresh Curran's memory with the actual sight and presence of the machines and structure which he only partly understood. Everywhere the conversion of the Station was evident. khaki-clad men worked in the corridors and compartments; welding arcs lit the piles of shattered and discarded scientific equipment that could be of no use to the Station in its new role of a fortress. The noise of riveters reminded Curran of the days when the Station was first being built, and the rattle had been echoed into a triumphant roll of drums heralding the rise of Man from his Earthbound beginnings to a new mastery among the stars. But it sounded different now. It sounded like machine guns.

Then, the Army engineers began to reach the end of Curran's knowledge, and to go beyond it, as they got the feel of their projects. He was only called, now, from time to time, in cases which lagged behind the general level of progress. He had more time to see what was being done to the Station.

Ships had been docking and leaving continuously. The vibration of the contact of ships and Station was almost constantly felt in the end of the Station near the lock. The ships had disgorged tools, and men and weapons—guns and chemical-explosive rocket-torpedoes to defend against enemy attack on the Station itself, and the great, sleek, rocket-driven, atomic bombs that had decimated the world below, and were now to dominate it from the Station; and the rocket-launching devices, and radars, and the intricate gun-pointing and rocket-directing machinery.

Most of the long-range equipment had gone to the astronomical observatory at the far end of the cylinder from the lock. Use would be made of the devices that had kept the telescope pointed at the desired object. But Curran had seen the great telescope itself, whose mounting had been so laborious and so painstaking, cut from its moorings with torches and stored, piece by piece, in a demolished laboratory.

The broken-walled blisters and other airless compartments were being repaired, or, more often, merely being cleared of wreckage by spacesuited men and fitted out with guns and rockets to be operated by remote control, or in a pinch, by crews in spacesuits. Laboratories became arsenals. The shops where the first interplanetary ship was in the process of construction were readied for the repair of weapons.

And the bodies of the previous occupants of the Station, when it had been the pinnacle of all man's peaceful progress, were being cleared from the places where they had labored and dreamed of conquest of the stars. There, they would only get in the way of the new men, the men of war. Curran, in his wanderings through the Station, saw the cold-laboratory where they were being taken.

"What will you do with them?" he asked a sergeant he found there.

"When we get them all in and sorted," the man replied, "we'll drop the temperature of this place down as far as it'll go, and leave them until things sorta settle down. Eventually, I guess, they'll go back to Earth for burial or cremation."

Curran's mind caught at the word. "Sorted?"

"Sure!" The man was astonished. "According to nationality. You wouldn't want Americans mixed in with anyone else, would you?"

General Coates had sent for him. The furor of construction was well under way, and Curran's job had dropped out from under him.

The general sat in the astronomer's office, drinking coffee and mopping his brow. He was alone, now. "Sit down, Curran!" he said. "I've got a breathing spell for a

few minutes. I understand you've given all the information you can?"

"Yes, sir," answered Curran. "If it will help take revenge for America—"

"Revenge," said the general, oddly. "Oh, yes, Curran. Don't worry about that. But you seem to have done quite a bit for America before we ever got here. How did you ever come to be the only man alive on the Station?"

The dull ache that had never left Curran swelled intolerably within him at the thought of casting his mind back over those nightmarish hours that had brought the Station to ruin. "I'd rather not, sir—"

"Oh, come now, Curran. There's no need to be modest. You know, you'll probably be decorated for this."

It hurt. Every word hurt. But —*You'll have to tell it eventually,* he thought, and forced himself over the tale, despite the mental anguish. It was penance for his dead comrades.

There was Lenormand, who had seen the first flares appear through the view window where he had happened to be standing. He had rushed into Curran's lab, in a state alternating between dazed horror and hysteria. There was Burroughs, who had been among those who crowded into the blister when the news first reached them, and had seen the great light that bloomed where he located his city of Manchester, and had had to be restrained after he had hurled himself against the clear crystal, trying to throw himself out into space, to be nearer his wife and child. He remembered how he himself had dropped a valuable and irreplaceable beaker of solution, and had flung the heavy and fragile Nakashira generator to the floor after it, in insane, ineffectual violence when he comprehended the shocking news.

Then the astronomers had turned their telescopes Earthward, and the news was confirmed in terms that chilled the men who saw with horror and inflamed them with burning, objectless rage.

"Dr. Svoboda called a general assembly," Curran went on. There was Svoboda, the gray-haired biologist that the UN had placed in charge of its Outer Station. His voice shook, and for the first time he had appeared old. "'We must remain above this horror on Earth,'" he had said. "'After the bombing and the shooting is over, the inhabitants of the planet will have sunk, in many respects, to a Neolithic existence. We, here, are self-sufficient. We must preserve science, and learning, and civilization, and return to Earth when the time comes, to re-establish order, in such a way that a catastrophe like this can never happen again. And we must keep on with our work on the *Argo,* so that if Earth is impossible to civilize, we can establish a colony on Venus, or even on Mars, that will never have a war. It will be difficult, but we must—'" Svoboda was dead now, thought Curran. He was a dreamer, and there is no place for dreamers while the flares burst hot and blue-

white in the night of a tortured world.

But the tension had grown. He saw the imperturbable Chang, in the radio room, clenching and unclenching his hands as the operators on the other end of the Station's beam to Earth called the black roll of chaos, and the list of cities off the air swelled. Off the air. We are sorry to interrupt this program. There will be a short delay of several centuries. Or millennia.

"I don't think it was the scientists who started it," said Curran. "It must have been the other personnel." But a Turk and a Greek got into a fist fight, and an Australian leaped at a Japanese and tried to strangle him, and a Moslem from Pakistan stabbed a Hindu in the stomach. Friction is contagious. Soon there came word to those who were trying fumblingly to work that a Paraguayan radio engineer had brained a Bolivian physicist with a wrench, and that a Heidelburg Ph.D. had had to be forcibly separated from one from Cambridge.

Then all pretense of continuing the normal work of the Station had collapsed, and men had gathered into whispering groups—groups which, for the first time in the Station's history, formed according to nationality.

"We Americans were all pretty bewildered at first," continued Curran. "We didn't know just what had happened, or what was going to happen; we stayed away from everyone else because we didn't know what any group might do at any moment. It had just penetrated to us that someone had *started* the shooting on Earth; we thought that whoever it was undoubtedly had agents on the Station, and we didn't know who they might be."

Then the fighting had begun to lose its sporadic and individual nature. Curran remembered how a group of Spaniards had invaded a room where some Frenchmen were holding a council of war, and how the first shots ever heard on the Station had echoed through the corridors. The sound, and the smell of powder, had been a catalyst to the violent release of the tremendous tension that had built up. Open war raged. The Americans held aloof for a while; then a chance shot had killed MacDonald —Curran still remembered how the physicist had looked as he fell—and they were plunged into the battle. Everyone was their enemy. Bombs from abroad had fallen on America —the men from abroad that had sent them must pay for their crime! Kill the aliens! Revenge for America!

"We began manufacturing bombs," said Curran. He remembered storming into a lab with the others, the shots that had made it theirs. The frantic assembly of makeshift equipment, of raw materials. Armed men around the lab, in all six directions, on guard.

The first bombs coming off the haywired assembly line. The first of them hurled down a corridor

against an enemy attack. The carnage of the explosion. "That'll show them, boys! Come on!"

Firing along corridors. Dropping to the floor as bullets ricocheted by overhead. Creeping to a corner. Firing down the cross-corridor. Pull back quickly. Give me a bomb. Another corridor cleared.

Throwing bombs into a compartment. Flatten yourself against the steel wall outside the door as they explode. Firing into the room. No reply. No sound. Go in and make sure. Shoot them if you think they're faking. Another room ours. Revenge for America!

Here's a blister. Big, broad window. Strongly held. Battling to the stairwell. Williams down. Where's Jones? Saw him a minute ago. Three bombs, wired together. There's the glass, with stars behind it. Throw at the stars. Leap back. Crash as the bomb goes off, crash as the air door slams across the stairway to the blister. We won't use that blister for a while—but neither will they.

They? Englishmen, Japanese, Russians, Argentines? Someone said something, a while ago. I didn't listen. They might have been anything. They're aliens, and

aliens attacked America. Death to aliens. Revenge for America!

Few hours ago, we only held that chem-lab. Now it's half the Station. Where's Rogers? Saw him quarter hour ago. Took that good-luck charm of his. His brother might want it. Tough. Where's his brother? Haven't seen him. Let's get that next sector.

Haven't heard so many bombs going off recently. Not so many shots, either. Half the Station. Anyone around? No enemies Kaplan was with me when we broke into that storeroom. What's happened to him now? Hey, Kaplan! Echoes.

Where am I now? Say, we must have almost three-quarters of the Station. This was deep enemy territory a while ago. Nobody around. Got an alien a few minutes back. Chink or Jap, by his face. Don't know which. didn't look close. Send a ricochet around that corner, in case. No result. Nobody there. Pretty near the center of the Station—my weight's low. Where is everybody?

Schwartz! Glad to see you. Where's Ryan? Dunno, saw him maybe half-hour ago. Come on, let's find someone.

Shots. From above. Duck into a compartment. There he is!. More shots. Almost no weight, up here. Got him! There he is, drifting through that hatch. Shoot again, in case. Revenge for America! Got him, Schwartz! Hey, Schwartz! *Schwartz!*

Then, a lone man, drifting through an echoing Station, soon without hate, without emotion, almost without thought, longing for death.

Curran was silent.

General Coates rose from his chair, paced excitedly across the office. He seemed exhilarated. "Wonderful, Curran! Truly wonderful! A true epic of American heroism!"

Curran was silent. The emotional exhaustion and the longing for death that he had had after the fighting returned with the telling of his story. He heard and saw the general as a figure on a telescreen, perceived through the beginnings of sleep.

"Clever, the way you worked it," said the general. "You held away from the fighting as long as you could, and let the aliens exhaust themselves. And when you did come in, you made sure of superior armament. That's the American way! You can't outsmart a Yankee!"

The general took another turn up and down the office. His excitement was mounting. "But the whole thing is as great an epic of heroism as I've ever heard. To start with just a handful of men and a laboratory, and to take the entire Station against odds! So that it would be ready for us to use as a base when we came! Wonderful!"

He sees only the glory of it, thought Curran. *But my friends and co-workers are dead, and the machines that were to reach the stars are broken.*

"Curran," said the general, "you're going to be decorated—and every American on the Station, posthumously. Or better still—you've shown yourself a true American. How'd you like to come in with us?"

"Come in with you?"

The general paced the office again, thoughtfully now. "Yes, Curran." He considered his words.

"You've shown that you're a true American, but you seem to be a bit confused on one point. I know that you want to help your country, no matter what, but I don't think revenge should be your central motive."

Curran stiffened.

"In a way, you *could* call it revenge. Other countries have been victimizing us for years. We went to war twice to help aliens out of difficulties, and then they got us into the United Nations so that they could force their will on us. They even tried to talk us into disarming, but we—our group—squelched that idea. *We* wouldn't give up *our* atom bombs.

"You see, the people in our group became alarmed some time ago at the way other nations were making a fool of America. Uncle Sap. We realized it was America's destiny to rule the world, and that if things went on the way they were then, we'd be cheated of our birthright. So we organized, got control quietly, and made our plans.

"When we were all ready, we launched a few atom bombs. We dropped them on England, which has been our great enemy all through our history, and we fixed it so that they would appear to come from Russia, which was our other great opponent for domination of the world. The war between them started right away, as we had hoped. Then we worked all the other countries into the squabble. We'd made our plans carefully, long ago.

"Of course, we were drawn into it eventually. We had hoped that the aliens would all knock each other out before that became necessary, but someone began throwing bombs our way sooner than we expected it. But we absorbed our losses; we were ready for bombing, and nobody else was. Anyway, most true Americans don't live in the big cities, and our greatest percentage loss was on the East Coast which is full of aliens and alien-minded people, anyway. Now, our armed forces have come out of hiding, and we've taken over the world. We'll rebuild it *our* way—an American world! The world is ours!

"And you—you've shown yourself a true American hero by the way you cleaned out the aliens here on the Station. Your group waited until the aliens were exhausted, just as we did; you absorbed heavy losses, as we did on Earth; but you came out on top. You have no idea how valuable this Station is to our plans; we can command all Earth with just the Station! But we need men like you in our Reconstruction. How about it? Will you come in with us?"

Curran rose tautly from his

chair. He was quivering; he hoped the general didn't notice it. "I'll . . . I'll think about it," he said. He went quickly out of the room.

He swung unseeingly down the long corridors of the Outer Station, the corridors that echoed with the sound of preparation of war. "Revenge for America." The words beat a bitter, sardonic rhythm in his brain.

Revenge for America. Revenge for the tall, and low, the sprawling and the crossroads cities, that lay in radioactive ruin across America. But most "true Americans" don't live in the big cities, he told himself bitterly. They don't deserve revenge.

These were the men who had destroyed a world groping towards salvation. A world of aliens. Aliens don't count. Only "true Americans" count. An "American" world.

They call themselves Americans, and they lay waste and conquer a world with all the treacherous savagery of a Jenghi-Khan, with all the muddy "super-race" rationalization of a Hitler!

These were the men who had destroyed the Station of Space, he raged mentally, as he paced blindly along the corridors. "We can command all Earth with the Station!" The Station that had been meant to serve as the spearhead for the conquest of the stars—for all men! The builders of this Station had looked up, not down.

The ghosts of all the men of science who had worked here for an ideal seemed to walk with him. Nakashira, and von Hohenburg, and Leblanc, and Spirelli, and old Svoboda. And with them, others. Lavoisier and Mendeleef and Einstein and Archimedes and Newton and Faraday. Fermi and Bohr and Kelvin and Curie. These dreamers had looked up to the stars—how often had their dreams been turned to the horrible task of crushing men to dust!

And this *patriot*, this pseudo-American wanted him to join in that perversion of science. He hated all those scheming xenophobes who used their cheap tricks of emotionalism and "patriotism" to divide science into nationalities and to turn scientists against each other. An "American" world! Rule Britannia! Hail, Mother Russia! Deutschland über Alles! Banzai, Dai Nippon!

And, probably, after they had grown tired of gloating over their "American" world, they would consider again with their bloody minds the smashed work of the dreamers of the stars. The Station would again become the spearhead of the conquest of space—with a difference. An "American" universe! He heard Coates' voice: "You wouldn't want to share the stars with all those foreigners, would you?"

These uniformed, military maggots who had never invented so much as a stone ax, but preyed on the minds of scientists for fiendish instruments of death!

He strode bitterly along the echoing corridors. Occasionally a sol-

dier looked up in surprise at his set, terrible face.

No, he thought, it wasn't only the military men, wasn't only their bigoted nationalism. They were the worst, the culmination and the symbol of it all, but they weren't what was basically wrong. What was basically wrong was that deep primeval kink in the minds of all men, the flaw of unreason that could, in an instant, under the proper circumstances, return an intelligent, sensitive individual, a dreamer, a *man* to depths of elemental fury beyond the cavemen, beyond even the savage unthinking animals from which the race had sprung—the flaw that had seized on the minds and emotions of a world of men and plummeted them into the long and dark agony of an age in which primitive fury and fanaticism would rule.

He remembered his screaming desire for revenge, his burning hate for all foreigners during the battle for the Station. He remembered how he had instantly assumed that the aliens had attacked America when he had seen the flashes on Earth. He remembered the insane, battling beasts that the scientists of the Station—the dreamers—had become. "And this is the animal we've been trying to give the stars to play with," he said softly.

The new-fallen animal that had taken the point of greatest advance towards the stars so far, and had made it a fortress to drop bombs on other animals of the same species on Earth. *The Dark-Age animal who would later use this Station to spread war and ruin and death among the shining stars, to enslave any beings living upon them who were less animals and more—men.*

Not if he could help it.

He turned his swift footsteps towards a stairway. Up and up he climbed, towards the weightless center of the Station, where hummed the atomic generator that powered it. Up and up, now leaping from deck to deck, as weight decreased. Up and up, faster and faster.

Just so had civilization climbed, higher and higher, faster and faster, from the savage barbarism after Rome's fall, until it had almost reached the pinnacle of reason and science and law and freedom to dream, had almost reached the stars—only to crumble and fall under the ancient cosmic fury of the primitive shadows of unreason lurking in the dim recesses of the human brain. The stars were Man's ideal. They were the dreams come true, the will-o'-the-wisp dreams of truth and reason, justice and freedom, untarnished by the brute unreason that had seized Man. Now the light had receded from Earth, and the fragile ideal of the stars was within the defiling grasp of the savages the civilized men of the Twentieth Century had become. The grasp must be broken. Dark-Age men must not be allowed to spread their terror and war beyond the confines of their weary world—not until civilization and reason had returned.

He remembered how Maroni, in

charge of the power plant in those dead days before the war, had showed him how a few minutes work could transform the compact plutonium reactor into a bomb more violent than the first ones exploded at New Mexico and over Japan and at Bikini. It had taken the greatest physicists of the world years to discover how to make a bomb out of fissionable material. Now one man could make an atomic bomb out of a chain reactor in a quarter of an hour. Progress.

He entered the shielded room. Guards had grown accustomed to passing him into any part of the Station. He floated to the reactor controls, said to the soldier there: "General Coates sent me up here. Seems there's some trouble with power supply. I'm supposed to fix it. You can step out for a smoke." The man left with alacrity. He knew the plant was fully automatic, but he still did not like to be left alone with it.

Curran opened a panel, exposed the control circuits of the pile. He knew just what he had to do. The circuits that had to be changed seemed to glow, to stand out from the others. He started to work.

This is best, he thought. The "patriots" who ruled the world now could never reconstruct the Station. They had rockets, true; but the farthest any rockets yet built could travel starting from Earth, was hardly farther than the Station itself. And the men who could build the rockets that could travel farther were dead—dead of their own folly, and in cold storage in a laboratory downstairs.

The Dark Age would come, and stay long. But, without the Station, the barbarians of that age would confine their barbarity to Earth, and would not disturb the serene, dreaming stars. Not until civilization grew again would they be within the reach of Man—and, perhaps, then, men would be wiser.

His hands worked deftly at the circuits. The ghosts that had walked with him before floated about him, and it seemed that they helped him. He thought Faraday handed him a soldering iron, and Newton drew the wire to be cut and re-connected from the involved tangle, and Kelvin checked the work and found it good.

The ghosts were all about him, advising, encouraging, helping. They were not only scientists. They were every man who had ever looked at the stars since Homo sapiens stood erect, and dreamed.

There was a disturbance at the entrance to the power room. Coates entered. Strangely, just as the ghosts of the dreamers became steadily more solid and real, Coates and his armed men were fading, fading into unreality.

"Curran! Dr. Curran! What are you doing? Get away from there!" cried the man of war.

"What is it, general?" mocked Curran as his hands worked. "Don't you trust a 'true American'?"

"What are you doing? I never authorized you to come up here!"

"No, and you never authorized me to look at the stars, either! You never authorized anything but the killing of men and the perversion of science!"

The general motioned to a soldier. "No, you don't, general! I can blow up the whole place before a bullet reaches me!" The soldier froze.

Curran was almost done. One connection more. The ghosts pressed close.

"Curran!" called the general. "What do you want? I'll give you anything! Get away from that pile and I'll make you world president! I've got the power to do it! Curran—" the fading man entreated him.

With the ghosts of all the dreamers of all the ages of all the intelligent races of the Universe guiding his hand, Curran made the last connection.

If any man on dark Earth had turned his eyes skyward and starward at that instant, he would have seen a great nova flare bright, and hang for a moment in the sky before fading again swiftly to darkness. And he would have seen the stars, as the moment of blinding flame receded, appear again, far and cold and aloof—and unreachable.

THE END.

IN TIMES TO COME

Next month, we have a yarn that has been asked about a number of times—it's called "Now You See It . . .". Hasn't been asked for by name of course, but it's Isaac Asimov's sequel to "The Mule," and concerns itself with the Second Foundation. It was natural enough that the Mule wouldn't give up with only one try at finding it. And it was equally natural that the Second Foundation would not be at all anxious to meet the Mule, and his powers. Powers both mental and purely physical, with the huge weight of arms and armor he had behind him by that time—

Finding a needle in a haystack is supposed to be tough. But it gets tougher when the needle is doing its best to make like a strand of hay!

Oh—and while making like a strand of hay, keeping its point well sharpened.

Part Three of "Children Of The Lens" will be with us, too, of course. Hm-m-m—come to think of it, this will *not* be the issue to skip buying, at that! And despite the fact we've added several tens of thousands of copies to our printing in recent months, the newsstands are still running out. And we're short on paper.

THE EDITOR.

Living on a planet of a white dwarf sun might give you a fine chance to understand stellar atomic physics—if you and the planet could live! Unfortunately, if you could stand the conditions, the planet couldn't—and vice versa. Now consider a planet with a ten-minute "year" . . .

WHITE DWARF STARS

• BY JOHN W. ABRAMS

Sirius is the brightest star in the Northern Sky, and is probably the star best known to most people. Its extreme brightness, however, is due merely to its proximity, otherwise it has no unusual features. Unlike our sun, it is not a solitary star wandering through space, but has a companion star, Sirius B, which accompanies it on its journeys. Actually, Sirius B is a far more interesting object than Sirius itself, for it is a representative member of the small group of stars known as white dwarfs, whose nature and properties are so unusual that they are almost beyond human comprehension.

It is all very well to say that a star is unusual, but before that statement can have any meaning we should know what constitutes a usual star. Clearly the stars cannot be judged by terrestrial standards, for we have no conditions on Earth which approach those on the stars, and to us all stellar conditions must be unusual. By an unusual or extraordinary star we mean a star whose characteristics differ radically from the general characteristics of most stars, to the same extent as an African pygmy would differ from the average Broadway crowd. True, the ordinary stars differ considerably among themselves, as do the people on Broadway, but ordinary stars do adhere to certain definite relationships. Of these the most important

is perhaps the so-called Russell-Hertzsprung relationship between absolute magnitude and spectral type. Inasmuch as the white dwarfs are usually recognized because they violate this relation, let us consider exactly what this means.

The system of measuring the magnitudes of the stars had its origin in antiquity. The brightest stars in the sky were called those of first magnitude, while the faintest that could be seen with the naked eye were taken to be those of sixth magnitude. With the advent of accurate methods of measurement these crude magnitudes became standardized, but the guiding principle remained the same. These magnitudes, denoted by M, are called apparent magnitudes. They depend upon two factors:

1. The intrinsic brightness of the star.

2. The distance of the star from us.

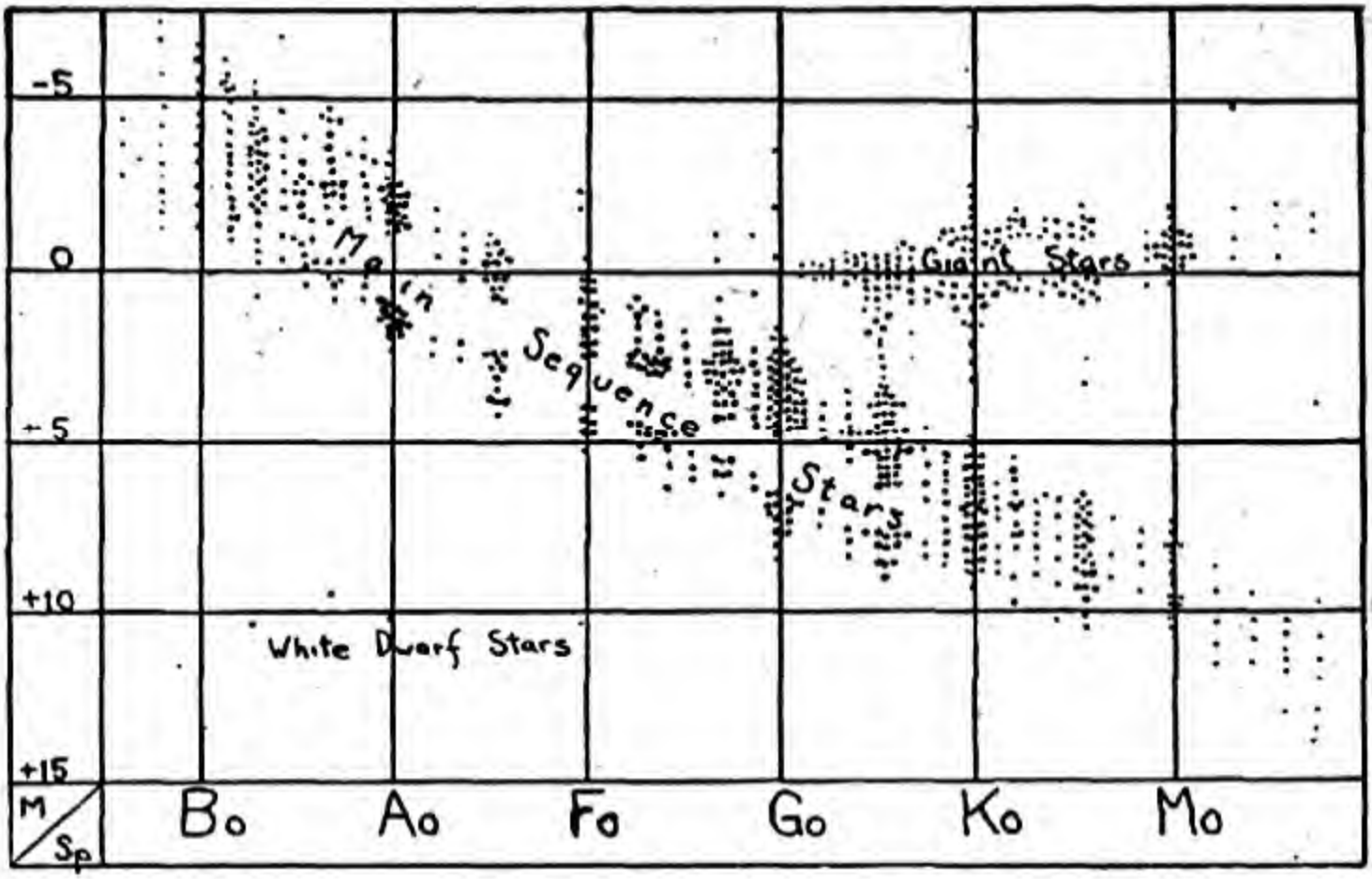
In order that we might be able to compare the intrinsic brightnesses of two stars located at different distances, the concept of absolute magnitude, denoted by M, was evolved. The absolute magnitude of a star is defined as the apparent magnitude that it would have to an observer if it were ten parsecs * distant. The two types of magnitude are related by the equation

$$M = m + 5 - 5 \log r$$

where r is the actual distance of the star in parsecs. Thus in absolute magnitude, M, we define a quantity which depends only on the intrinsic brightness of the star; that is, on the amount of radiation which the star gives off. It differs from the apparent magnitude in that it depends only on the nature of the star itself, and not on its distance from the observer. It is this quantity, M, that is found to be related to the spectral type of the star.

But what is meant by the spectral type of a star? In fact what kind of a spectrum does a star have? Superficially most stellar spectra do not differ very much from that of the sun, which is a continuous spectrum—like a rainbow—crossed by a number of dark lines, the so-called Frauenhofer lines. It has been shown that these lines are of the same wave lengths as those given off by terrestrial elements, so we are able to extend our spectroscopic data from the laboratory to the stars and vice versa. Now when we examine stellar spectra for these lines we find that different lines appear in different stars. For example, certain stars are characterized by the presence of the lines of ionized helium, others by conspicuous hydrogen lines, more by a great number of metallic lines, and still others by the presence of bands or molecular spectra. Now as these lines are caused by absorption in the atmospheres or outer layers of the stars, we might assume at first glance that these lines are observed because of the widely different chemical compositions of the stars involved. That this is not the case

* The parsec, which is the technical astronomical measure of distance is equal to 3.26 light-years, or 1.92×10^{13} miles.



The Russell Diagram of star-power-output vs. spectral class. High positive magnitudes—vertical scale—mean low output; negative magnitudes, high output. Sun is just above Go-plus 5 cross-over.

was shown by Saha, the famous Indian astrophysicist, who proved that the differences in stellar spectra were due principally to differences in the surface temperatures of the stars.

Even before it was understood why stars of different temperatures should have different spectra, a great Italian astronomer, Father Secchi, divided the spectra of the stars into four groups according to their appearance. Next a group of astronomers, principally at Harvard, increased the number of groups, so that they could be arranged in a sequence with one type gradually blending into the next. These so-called spectral types or classes indicate roughly the temperatures of the outer layers of the star, and arranged in order of decreasing temperatures are called O, B, A, F, G, K, M, R, N, and S. The spectral classes are further subdivided with a decimal notation, so that we encounter such typical classifications as F8, G5, BO et cetera. For example, our sun is a GO star, Sirius is an AO star, and Sirius B is an A5 star. It should be noted that a white dwarf does not show a markedly different spectrum from an ordinary star. It is true, however, that closer examination will show differences, par-

ticularly in the width of the spectrum lines.

If we plot spectral type against absolute magnitude for a great number of individual stars, we get a typical Russell-Hertzsprung diagram—see Fig. 1. The group of stars which runs diagonally from the upper left-hand corner to the lower right-hand corner is called the Main Sequence; it contains the normal dwarf stars among others. Our sun is a member of this sequence. The stars above the diagonal, and in the upper right-hand section of the diagram are the so-called giant stars. The small group of stars in the lower left-hand corner comprises the white dwarfs. Thus, we see, these stars are unusual in the first place by their rarity. In fact, of the millions of stars investigated to this day, only about eighty are known to be white dwarfs. But, the unusual character of the white dwarfs is not confined to their rarity as we soon shall see.

Fortunately for us Sirius is a double star system. By observation of a double star system for a period of years it is possible to determine the masses of the two components from measures of their relative motion. From such masses of double stars Eddington found a simple relation between the mass and absolute magnitude of a star. This relation was found to hold for practically all the stars; in fact, the only exceptions that he found to this law were the two then-known white dwarfs. These stood out markedly from the rest of the stars; for example, Sirius B, although one ten-thousandth the brightness of Sirius was found to have two-fifths of its mass.

When from further considerations it was found possible to determine the densities of the stars the white dwarfs began to show their truly unusual character. The densities of most stars proved to be in general interesting, but not impossible data. Stars of the Main Sequence were found to have a density somewhat of the order of magnitude of water, while giants were found to be extremely tenuous: Antares, for example, was found to have a mean density about one three-thousandth that of water. However, the white dwarfs gave a seemingly impossible result. Their densities were found to be about one hundred thousand times that of water, or some four thousand times as dense as any known material. Although this result was at first greeted with justifiable skepticism, it was soon found to be real and a proper theoretical explanation given for it. These densities have since been confirmed by an entirely different method based on the General Theory of Relativity—the red shift.

About the same time as the enormous density was found for Sirius B, the theoretical physicists were considering what must happen to matter under conditions of extremely high pressures. The outcome of this was the theory of degenerate matter.

If we consider matter to be composed of atoms—which themselves

are composed of nuclei surrounded by planetary electrons—the concept of degenerate matter becomes easy to visualize. First, let us turn to the simpler model of an atom which is used in the ordinary kinetic theory of gases from which we derive our ordinary gas laws. There the atoms behave as if they are solid spherical balls moving in a spacious enclosure, but with considerable space between the balls. The radii of these spheres correspond to the distance from the nucleus to the outermost planetary electron in our more refined model. Now let us compress our gas until we have reduced the volume of the enclosure to the volume of the spherical atoms contained within it. Up to this point the gas behaves as normal matter. However, we know from our more refined model that these spheres are not truly solid, but are similar to miniature solar systems with much room between the nuclei and outer electrons. What happens if we are able to apply more compressing force and squeeze out atoms even closer together? When we do this the orbits of the outer electrons overlap, and this sets up disturbing forces which destroy the normal balance of our atomic systems. We find that the atoms of the gas no longer consist of well-organized systems of planetary electrons, but instead we have a mass of electrons and nuclei with no particular electron belonging to any particular nucleus. The material still behaves as a gas—no longer as an ordinary gas, but rather as a degenerate gas. Thus by continuing to compress the matter, we change its character. This super-compressed matter is the principal stuff of which white dwarfs are formed.

White dwarfs are not the only place where degenerate matter is found in nature. All stars have degenerate cores in their far interiors, but in most stars this core of extremely dense material is counterbalanced by a highly rarified atmosphere so that the mean densities are as given previously. However, the white dwarfs are far more degenerate than normal stars as we shall soon see.

It has been believed for many years that the stars have their energy sources in subatomic processes. These processes alone afford sufficient energy so that the star will not burn itself out in too short a time. Within the last few years the actual nuclear reactions which take place in the stars have been identified and their mechanisms explained. By means of them atomic energy is released within the star, which proceeds to radiate it out into space. The active ingredient or fuel in these reactions is hydrogen, which is converted into helium as an end product. However, even an atomic furnace is not inexhaustible, and a time must come when all the available hydrogen has been consumed. When this stage is reached the star is well on its way to becoming a white dwarf.

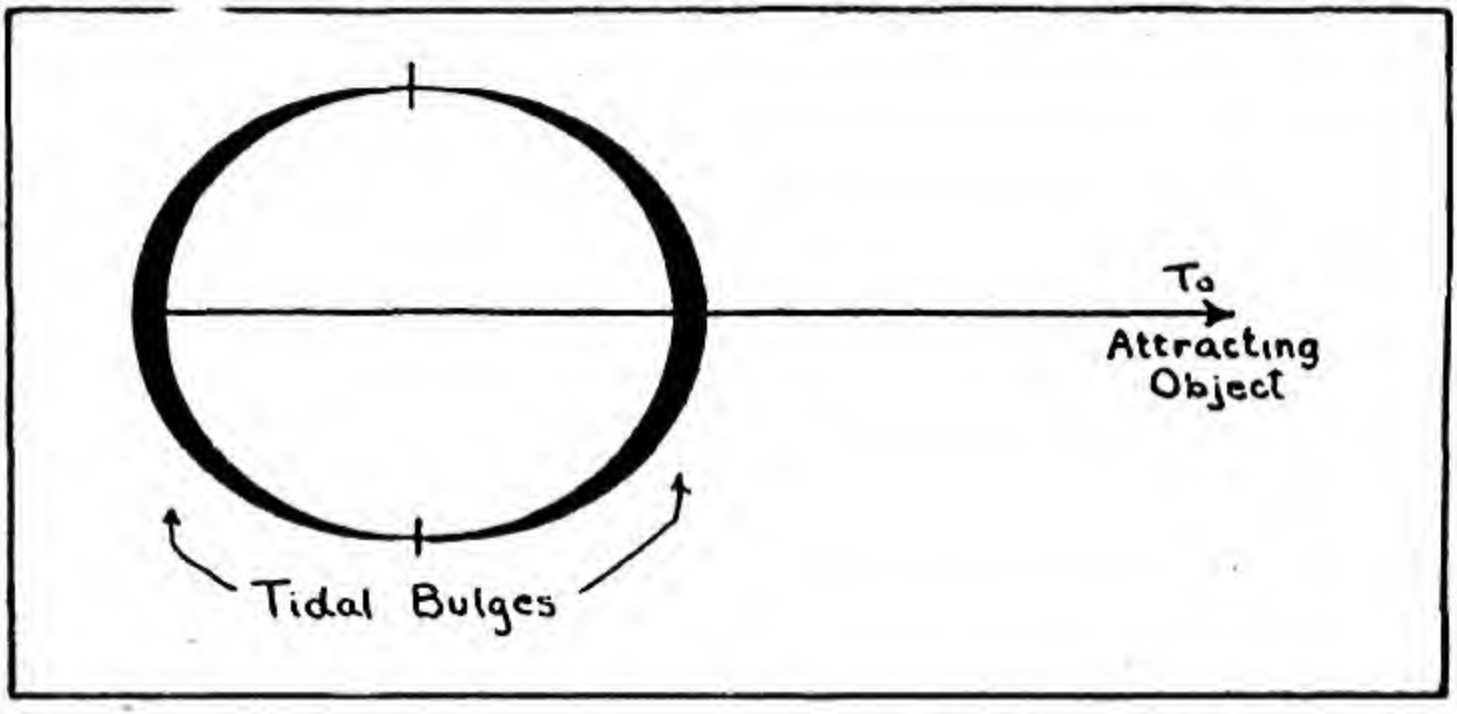
It is necessary to digress somewhat and consider what is believed to be the true nature of a star. Without discussing the origin of

the stars, which is really a complete story in itself, we can consider a star as being formed from a tremendous amount of gas in space. The mutual gravitational attractions within this gas will cause it to assume a spherical shape, and embark on a self-induced compression. But this compression will cause the gas to increase in temperature in the same way as we observe the gas in a tire pump to become heated. Heat energy formed in this way is said to arise from the gravitational potential energy of the gas. The gravitational compression will continue until it becomes equalized by an outward force and pressure, and the star comes into a stable state.

The balancing forces are of two types, and both are called into being by the gravitational compression itself. The first of these is the expansive force of the hot compressed gas; the second the pressure of radiation. This latter pressure owes its origin to the fact that as the gas heats up in being compressed it tends to radiate some of this heat energy out into space, and the outward traveling radiation exerts a pressure on the outer layers of the star. Thus it, too, acts against the gravitational compression. If no other processes entered, our mass of gas would continue to compress itself until it reached a state of equilibrium, when it would be a glowing ball of essentially degenerate matter. In fact, it would become a white dwarf!

However, we have left out a major factor. As the gas compresses itself, the interior of the mass becomes increasingly hot.

Tides, even on Earth, are not confined to liquid water; both the atmosphere and the solid rock of the crust bulge slightly under tidal influence. In a really massive gravitational field, it wouldn't be slight!



When the temperature at the center becomes of the order of millions of degrees it reaches what might well be described as the combustion point for the subatomic or thermonuclear reactions. The subatomic furnaces in the interior of the star come to life, and release such a flood of radiant energy that the compression is halted, and in some cases actually reversed. As long as there is hydrogen fuel for the furnace, the radiation pressure—in addition to the gas pressure—will sustain the weight of the outer layers of the star. Eventually, after a period of millions of years for normal stars, the supply of hydrogen will run out. When this happens there are apparently no other subatomic processes available to the star, the subatomic fires are quenched, and the outward forces are no longer able to delay the contraction process. The star continues to shine and radiate for a time but now it gains its energy solely through the utilization of its gravitational potential energy and thus it must steadily contract. As it contracts, the pressures in its interior will steadily increase, and the star's matter will become increasingly degenerate. The star no longer exists on atomic energy, but is wasting away and dying. In fact it could be called, without exaggeration, a senile star.

The eventual fate of these stars may be of interest. They will die; by which we mean that they will practically cease to radiate and become dark stars. In terms of our above model they will reach the point where the resistance of the degenerate matter will be able alone to compensate the gravitational compression, and the star will cool off by radiation. A recent announcement by Luyten of Minnesota tells of the discovery of a "white dwarf" which has cooled down now to a temperature comparable with that of the sun. Stars even cooler than this may exist in fair numbers, but our chance of seeing one from the Earth are small.

When one speaks of a white dwarf cooling down, the term "cooling" must be used with caution. To an observer at a distance there will be nothing extraordinary about the process of cooling. Such an observer will determine the temperature of the star solely by the amount of heat which it radiates, and to such an observer the star will appear to be cool. However, we must not make the mistake of assuming that conditions within the star will indicate the low amount of energy which we would normally associate with a cool star. Internally the star cannot cool down, which gives rise to one of the strangest situations in the universe. In order to cool down, the degenerate matter must expand to normal matter, but in order to expand, it must overcome the gravitational forces which have forced it to its present state, and it does not have sufficient energy to do this. As a result it is in the almost impossible situation of being too hot and too dense to cool down, but it lacks the energy to maintain its high temperature. At first this problem appears to be insoluble, but

the star solves it by refusing to lose any more of its energy by radiation, and thus appears cool to an outside observer. In a way it is in the position of a man who has an object of considerable value in a pawnshop. He cannot sell or dispose of the object—radiate the energy away—because he cannot pay the pawnbroker's fee—the gravitational energy.

The age of a white dwarf is a most important point, particularly to one interested in the planetary systems which may surround them, and in the forms of life that may be on these planets. We have spoken of them as senile stars, which at once conjures up the picture of old and worn out suns. How are we to reconcile this picture with the recent cosmological theories which apparently show that the entire galaxy was formed about the same time, and hence all stars should be of essentially the same age? This can be done if we consider "white dwarfism" as a deficiency disease of the stars, which induces premature senility. Human deficiency diseases are well known, and in most human cases the deficient substance can be recognized and prescribed by a doctor. In white dwarfs we know that the deficient substance is hydrogen, but there are no stellar doctors. All stars will eventually use up their hydrogen: but the white dwarfs are stellar cretins, they were born with a hydrogen deficiency and hence have grown old prematurely.

The white dwarfs then represent an extreme case. They have grown old while they are still comparatively children, and will die much sooner than other normal stars. This introduces a very interesting conception of age in a galactic system. It is far different than the age which we are accustomed to apply to humans. True, people apparently age at different rates, but the amount of variation is quite small. Neglecting disease and accidents, the ancient rule of threescore and ten holds reasonably well. We can form a fair guess of a man's age by looking at him. Stars are different. In the first place they are all approximately of the same age, and secondly they are aging at decidedly different rates depending on their composition. The white dwarfs, which have used up their hydrogen, are already senile: others of the same age in years, but with more abundant supplies of hydrogen, act as if they are still youthful. Actually some stars are still in their childhood: some are at middle age; some are dying (white dwarfs); and some are actually dead (black stars). Age, for stars, should not be measured in years, but rather in the amount of hydrogen available to the star.

The fact that we have stars with different amounts of hydrogen, and hence different chemical compositions should not surprise us. The more surprising fact is that the stars are so similar in composition. Most stars are made of the same basic materials in the same proportions and the star which deviates considerably from the norm is unusual.

Many of these deviations are noticeable to us through exacting spectral analysis, many more we probably cannot detect, but the deficiency of hydrogen becomes increasingly evident as time passes by. In most cases the deviations are small, but the white dwarfs again show themselves to be exceptions.

Let us look back and put together what we know about these stars. They are old, not in the usual sense of the word meaning age in years, but in the sense that they have passed through the major portion of their lives and have experienced the consequent evolutionary changes. Their interiors consist, in the main, of degenerate matter. This indicates that the gravitational compressive forces are so great that hypothetical electron orbits about the atomic nuclei in the interior are forced to interpenetrate. The atomic fires have gone out inside them, and their energy comes from gravitational potential. Although they want to expand, being urged to do so by gas pressure, they have not the required amount of energy to overcome their gravitational compression. They will continue to contract and radiate away their precious remaining store of energy until such time as their gravitational and gas pressures come into equilibrium, and they stop radiating and become dark.

Superficially most white dwarfs appear to be a long way from dead or even dying. Their surface temperatures are high among the stars, and are of the order of magnitude of 10,000° Centigrade. With this surface temperature they are considerably hotter than the sun—6,000°—and just slightly cooler than Sirius. There is considerable variation in these figures for individual stars, and the surface temperatures for some approach that for the very hottest type of star, the Wolf-Rayet stars, which is about 25,000°C. This characteristic of a white dwarf, high surface temperature combined with small radius, is probably the one which would appear most extraordinary to a visitor to its planetary system.

Let us be such a visitor, visiting a planet similar to the Earth located about one Astronomical Unit * from a lone white dwarf with characteristics similar to Sirius B. The first thing that would appear strange would be the fact that there would be no sun in the sky. By this is meant that there would be no self-luminous object with a noticeable disk. Instead there would be one conspicuously bright star, whose proximity would be evinced by its motion. The disk would be plainly visible through even the simplest opera glasses, and would be about the same size as Jupiter appears to us on Earth. The star would be considerably more blue than the sun, and give a surprising amount of light. In fact it would be quite easy to read under the light of the star, and distinct shadows would be cast. The nature of the planet's at-

* The Astronomical Unit is the mean distance of the Earth from the Sun, about 93,000,000 miles.

mosphere would be extremely important as regards the amount of radiation from the star which would reach its surface. With an atmosphere similar to that of the Earth the percentage of ultraviolet light reaching the surface would be more than we receive from the sun, but the major part of the ultraviolet radiation would be absorbed by the planet's atmosphere. This could well lead to fluorescence and a gentle all-pervading aurora might be expected. Radio conditions on the planet would be extremely variable, and show tremendous changes at dawn and sundown.

When observed with telescopic instruments the star would show several differences from ordinary stars, but principally in degree rather than in new phenomena. It is a peculiar fact that astronomers know more about the interiors of white dwarfs than they do about other stars, but know far less about their outer atmospheres. One of the major reasons for this will become apparent later.

From outer space the appearance of the star would be quite deceptive. Since its mass would be not much less than the mass of an ordinary star it would exert the same gravitational attraction on a spaceship as any average star. However, if one judged its distance by its apparent diameter it would exert an unexpectedly great gravitational attraction. Perhaps these white dwarfs may some time become the reefs on which unwary spaceships may become wrecked. Otherwise the superficial appearance of a white dwarf would not differ significantly from that of a normal star.

Although visitors to the planetary system of a white dwarf have been mentioned, nothing has been said about native inhabitants. Is there a reason for this? Yes, we just don't know, and probably won't until one or the other of us develops interstellar travel. However, if we accept the theory of stellar evolution given by Professor Gamow of George Washington University we can give a shrewd guess that there just won't be any. According to Gamow's theory the white dwarfs are at the end of an evolutionary sequence of stars. In that sequence the stars begin their development as rather cool red objects, and gradually increase in temperature with time thus increasing their energy output. At their zenith they give off tremendous amounts of energy. Thus in its heyday, our white dwarf must have been such a great star that it would have burned off and destroyed all the life, such as we know it, on the planet which we have just visited in fancy. Such a planet might have life on it, but in that case the life would be as much an interloper from outer space as our visitor.

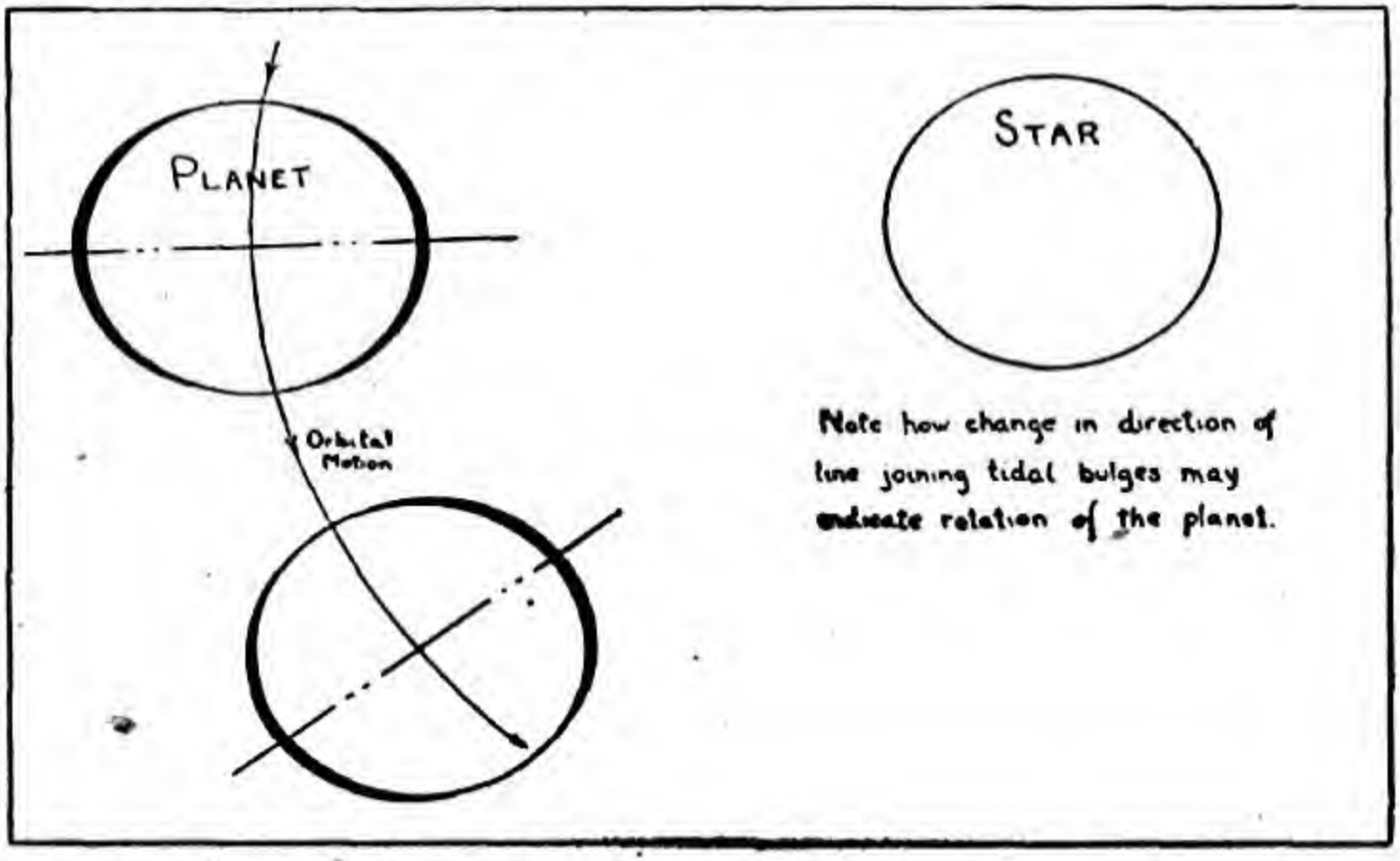
Let us not be content to spend our visit to the white dwarf system on this one planet, but let us approach closer to the star itself. We may suppose for the moment that we are fortunate enough to find a member of the white dwarf's planetary system whose mean distance from the star is about 300,000

miles. Actually we should be highly surprised to find such a planet, but imagining it to exist will be of value to us because from this planet the white dwarf star will have approximately the same apparent diameter as the sun appears to have to us on Earth. It will be of interest to investigate the peculiar situation which will prevail here, and to consider how unhappy we should probably be if this were our natal planet.

The difficulties of developing a consistent system of mechanics for this world would be almost unsurmountable. We shall see later that the planet will probably be spinning at such a rate that centrifugal force will actually exceed gravity near the equator. This fact alone would so greatly complicate the problems of mechanical motion that the discovery of Newtonian mechanics would be difficult. However, if as natives of such a planet we, in the course of time, had developed such a system we should be distinctly concerned because it would not be able to treat such a simple problem as that of our orbital motion about the white dwarf. This difficulty would arise in the following manner.

Astronomical observations made from such a planet would show that the planet completed one revolution about the star in about ten

Making a tidal bulge move with respect to the main mass of a body consumes energy; on Earth, weak tidal forces and enormous available rotational energy allow moving tides after 2,500,000,000 years.



terrestrial minutes. In other words, the "year" of this planet would be ten minutes long. As a result its speed in its orbit would be about 4,000 miles per second, a rather goodly figure even to astronomers. Because of this the Newtonian equations of motion would be inadequate to give an accurate solution for the problem, for when such great speeds are involved the relativistic—or Einstein—equations must be used. The predicted orbit for the planet would be similar to that observed, but the discrepancy would be sufficient to discredit the Newtonian mechanics.

The simplest of these discrepancies would be that the orbit of the planet would not be an ellipse as predicted, but would be a somewhat distorted ellipse. A similar situation to this prevails in our own Solar System in the case of Mercury, but in this case the discrepancy is so slight that it can be revealed only by very careful measurements. Due to the greater speed of our hypothetical planet these "relativistic deviations" would be apparent to the simplest of instruments. The situation would be further complicated, because the outer planets of the system would appear to follow Newton's Laws, and consequently the inhabitants of the close planet might be led to conclude that theirs was an unique planet subject to laws different from any other.

Tidal forces on our close planet would be a matter of considerable import to us. In order to consider tides it will not be necessary for us to postulate the existence of a satellite, for the tides raised by the white dwarf itself will be considerable. This situation should not be surprising if we recall that of the total tidal forces acting on the Earth two-thirds come from the moon and roughly one-third from the sun. Here we should expect to have enormous tides raised by the white dwarf alone. We might investigate the magnitude of this tide-raising force as compared to that of the sun and moon on the Earth. The results of this calculation would be startling, the tidal forces on this planet turning out to be about 5,000,000 times as great as they are on Earth.

What sort of effect should we expect? Should we expect mountainous waves of water to follow around the planet every five minutes inundating everything? No, I am afraid that such a planet would not exist very long. The very tidal forces would tear it to pieces, and it would be broken up into small fragments, each of which would pursue its own orbit around the white dwarf—a second asteroid belt. In regard to this it is interesting to note that it would not be necessary for the planet to have any original rotary motion of its own in order that such action should occur, for even if rotation were absent at any initial time the tidal forces and friction would soon set the planet in rotation about its own axis. Let us see how this would occur.

The effect of tidal forces, which are in essence merely gravitational

forces, is to raise two bulges upon an otherwise spherical planet, as shown in (Fig. 2). The nearer of these bulges will be more strongly attracted than the main body of the planet, and will tend to point towards the star while the planet undergoes its motion of revolution. Due to the internal cohesive and frictional forces of the matter of which the planet is composed, the actual body of the planet will be dragged along as can be seen in (Fig. 3), and the net result will be a rotation of the planet.

We have chosen our planet to be very similar to Earth in size and constitution; let us now see how close to the white dwarf such a planet can exist without being torn to pieces. Actually there is an inner limit about any star or planet within which a planet of given size and density cannot exist. This limit is known as Roche's Limit, and is expressed in terms of the radius of the primary. In our case it is about seventy-one times the radius of the white dwarf or some 1,800,000 miles. Hence we see that we have been visiting a truly imaginary planet, inasmuch as it would have been torn to pieces long before we arrived upon the scene. Our terrifying tides will never occur in fact.

The obvious question which immediately arises in our minds is, "Could this planet exist if it were made of some stronger, more cohesive substances than the Earth?" For any known normal substance —excluding degenerate matter—the answer is still no, though less emphatically. As the density of the planet increases, Roche's Limit decreases, and a planet of the density of osmium could exist as close as 1,000,000 miles from the white dwarf. The tremendous tidal forces would no longer be able to rip this planet to pieces, but neither would our terrifying tides develop as the planet would soon reach a state in which it always presented the same face to the star. Such a state would be reached in order to minimize the effects of tidal friction, and would mean that the "day" and the "year" of the planet would be of the same length. In our own Solar System such a situation has probably been achieved by Mercury, and has actually been achieved by the moon in the Earth-Moon system.

Even if we could locate the unbelievably dense material to build our close planet we should be in trouble. As an example, the atmosphere of such a planet would certainly be of interest to either an inhabitant or a visitor. Under ordinary circumstances we know that this planet would possess sufficient mass to retain an atmosphere, but would this be true in the present case? Let us see. We know that this planet has reached the state where its day and year will be of the same length. The day of our planet will then be of the order of magnitude of ten minutes. Now an object rotating with such an angular velocity that its period is ten minutes will certainly set up a tremendous centrifugal force near its

equator. This force will tend to counteract gravity, and it will be of interest to calculate whether or not it will diminish gravity to such an extent that the planet will lose any atmosphere which it may have acquired.

The answer is clear, definitely no atmosphere. In fact the situation is really bad, for within about 60° of the equator, the centrifugal force will exceed that of gravity. No atmosphere could be retained, no seas or oceans could exist, even loose stones or boulders would be cast out into space, and any human who would be so unwary as to move about unanchored to the ground would embark on a rapid solo flight. Even the suction cups of insects such as flies would be of no value, as they could not work due to the absence of atmospheric pressure.

If this seems too strange, reflect a while. We just showed that such a planet could not exist if it were made of ordinary materials; so why should we be amazed if these ordinary materials are cast out into space just as we predicted? No, I am afraid that we shall just have to give up the satisfying idea of a planet sufficiently close to the white dwarf that its inhabitants, if any, could study it as well as we study the sun.

It really is too bad that such a planet could not exist, because the view of the white dwarf which would be obtained from it would be magnificent. The planet, of course, would always present its same face to the sun, and its sun would be a worth-while sight. The central part of the star would appear as a glowing blue hot ball, but it would be surrounded by what would appear to be gigantic fires. These would be principally manifested by tremendous jets of flame bursting out from the star and shooting out into space for a distance of about the star's radius or more before vanishing. Occasionally some superjet might shoot out so far that it would approach the planet. The flames would not always be of the ruddy type that we associate with log fires and earthly flames, but would be of various colors from deep red to blue-violet.

Beyond the range of the flames the sky would be gently illuminated by a pale glow which would surround the star. The region of glow would not be fixed in shape, but would gradually change from circular to elliptical forms and even to irregular shapes and radiant streamers. Its color would never be clearly marked, but would be predominantly gray showing pastel shades at times.

Beyond the glow, the sky would be black and myriads of stars would appear in the sky simultaneously with the sun. Peculiarly the sun would remain fixed in the sky, but the stars would move across the sky, as they do for us on Earth. Stupendous as this sight would appear, I must add a sobering word. Actually the jets—prominences—and the glow—corona—would be less from the white dwarf than they would be from a larger star. Their effect is only magnified by the proximity.

Almost any portion of the galaxy contains white dwarfs—but until we get those interstellar cruisers, we can not find them beyond a few dozen light-years. They, though interesting, are dwarfs among giants.

Now, although we have shown that no ordinary planet can exist very near a white dwarf, there is still another possibility of a very close object; namely, another white dwarf. We have shown that as an object becomes more dense it can exist closer to the star, and surely nothing will be more dense than another white dwarf star. You may say that in this case we will no longer have a single white dwarf, but what is the difference? Binary stars are certainly not unusual in our galaxy, and the probability that a white dwarf binary may exist is rather high. To our visitor to the solar system of the white dwarf this circumstance might not be very important, but to us poor terrestrial astronomers the discovery of a double white dwarf would be a matter for considerable rejoicing, particularly if their plane of rotation should be so oriented that the stars would eclipse each other as seen from Earth.

In a recent lecture to the American Astronomical Society Dr. Henry Norris Russell of Princeton,

one of America's most distinguished astronomers and co-discoverer of the Russell-Hertzsprung relationship, spoke of the possibility of such a pair. He mentioned it in connection wth a lecture on eclipses and the information which can be obtained about the nature of the sun and stars by eclipse observations. It is a well-known fact that astronomers are always sending expeditions to observe solar eclipses, but the reasons why the observations so obtained are valuable are not always known.

In order to observe conditions in the solar atmosphere it is highly advantageous to obtain the light from only a part of the sun. In this manner one can determine how conditions differ at different parts of the sun's surface and deduce from this information the conditions which obtain at different levels of the sun's atmosphere. With some of the most modern instruments, astronomers can gather part of this information even without an eclipse, but the eclipse observations are still the best and of the most value.

In the case of stars, eclipsing binaries are even more valuable because the information gained by observation of their eclipses cannot be obtained in any other way. We never see the stars as anything else but pinpoints of light in even the largest telescopes, and consequently are not normally able to make observations on a particular region of their surfaces. However, during the eclipse of one member of a pair by its companion such information can be obtained.

Observations of stars which eclipse one another are very much sought after, and there are whole rafts of observations of such eclipsing binaries. These stars are usually discovered by their variable character, which arises from the fact that the light emanating from one member of the pair is cut off from us during the eclipse. Unfortunately no white dwarf eclipsing binaries have been discovered. This is one of the reasons why we can speak with some degree of certainty only about the interiors of the white dwarfs, but are not so well informed about their atmospheres. An eclipsing white dwarf binary would enable this article to be considerably extended.

Why is it that we speak about white dwarf binaries so glibly, but admit that none has ever been discovered? We do not consider that they should be rarities, but we do admit that they are going to be difficult for us to find. When two stars of small diameter are sufficiently close that they are able to eclipse one another completely, they will also be in rapid rotation about one another. In the case of two white dwarfs the period of rotation is going to be very small, and the duration of the eclipse of the order of magnitude of seconds.

Such a variable star is certainly not going to be discovered photographically as the average exposure time will be far too long. Visual discovery is also unlikely, because so few visual observations are made of faint stars. This leaves only

photoelectric observations as a means of revealing the existence of such a pair.

However, efficient photoelectric photometers are somewhat of an innovation, and sufficient observations have not been made as yet that we should expect them to reveal such a pair even if many of these pairs exist. I'll be willing to make any reader an offer in this respect. I have a photoelectric photometer attached to a good telescope, and if you will furnish me with a pair of eclipsing white dwarfs I will write you another article in which I will tell you just what goes on in the star's atmosphere.

THE END.

THE ANALYTICAL LABORATORY

Shortage of space the last few months has seriously handicapped the Lab; this month we have two reports to present. First, is the August issue:

PLACE	STORY	AUTHOR	POINTS
1.	Propagandist	Murray Leinster	2.08
2.	The End Is Not Yet (Pt. 1)	L. Ron Hubbard	2.53
3.	Person From Porlock	Raymond F. Jones	2.91
4.	Insomnia, Inc.	Harry Walton	3.22
5.	Rat Race	George O. Smith	3.63

The selection of "Propagandist" for No. 1 is interesting; apparently there's a real place for well-handled emotional appeal even in the somewhat coldly intellectual field of science-fiction!

And in September, the choice for first place, "Hobbyist," is even more pronounced—in terms of point-score differences—and is again a score for the more emotional than intellectual concept.

On the other hand, maybe it's because both Leinster and Russell happen to be darned good, highly-skilled craftsmen?

PLACE	STORY	AUTHOR	POINTS
1.	Hobbyist	Eric Frank Russell	1.81
2.	The End Is Not Yet	L. Ron Hubbard	2.81
3.	I'll Build Your Dream Castle	Jack Vance	3.09
4.	Meddler's Moon	George O. Smith	3.79
5.	Conquest	O. W. Hopkinson, Jr.	3.97

THE EDITOR

BY E. E. SMITH

CHILDREN OF THE LENS

Illustrated by Rogers

***Second** of four parts. The plan of the Arisians was a long, slow plan: only slowly its culmination was working toward the necessary final test—*

Synopsis

When the inertialess drive was perfected and commerce throughout the Galaxy became commonplace, crime became so rampant as to threaten Civilization. Then came into being the Galactic Patrol, an organization whose highest members, the Unattached, or "Gray" Lensmen, are of unlimited authority and range. Each Lensman is identified by his Lens, a pseudo-living, telepathic jewel matched to the ego of its owner by the Arisians, a race of beings of unthinkable age and of corresponding power of mind. The Lens glows with color while worn by its owner, but kills any other who attempts to wear it.

Of all the eighteen-year-old boys of Earth, only a few each year win through the five-year period of elimination and become Lensmen. Kimball Kinnison graduated Number One in his class and plunged immediately into the war with Boskonia, an abhorrent, dictatorial culture diametrically opposed to every ideal of Civilization. He and Wor-

scl of Velantia, a winged, somewhat serpentlike reptilian Lensman, overcame the Overlords of Delgon. These creatures, natives of the world nearest Velantia, had been preying upon the Velantians for ages, torturing them to death and feasting upon their life-forces. Wounded and sent to Base Hospital, Kinnison met and loved Sector Chief Nurse Clarrissa MacDougall, an auburn-haired beauty with unusual powers of mind.

Kinnison and Worsel guided the Grand Fleet of the Galactic Patrol in crushing the military strength of Boskonia, but the real heads of the enemy remained hidden. Kinnison went to Arisia for advanced training, acquiring the sense of perception and a superhypnotic ability to control the minds of others; which ability, however, could not work through a thought-screen. He became acquainted with Tregonsee of Rigel IV, a Lensman having the sense of perception instead of sight, an oil-drumlike body, and tentacular arms; also with Lensman Nadreck of Palain VII, a frigid-blooded poison-breather. These four, Kinnison, Worsel, Tregonsee, and Nadreck, were called Second-Stage Lensmen because they were the only ones then able to assimilate the extraordinary powers conferred by advanced Arisian training.

They found that Boskone's supreme command was in the Second Galaxy, and scouted it. Kinnison was captured, blinded, and tortured. His companions rescued him. His hands and feet had to be amputated, but Phillips, a Posenian surgeon, having completed his researches in hormonial neurology, caused new members to grow in place of those lost.

Civilization's Grand Fleet invaded the Second Galaxy and destroyed two headquarters planets; one with a negative-matter bomb of planetary antimass, the other by collision with planets placed in the inertialess condition, then inerted. Boskonia counterattacked; Tellus being saved by the "sunbeam", a concentration of all the energy of the Sun into one beam.

One nameless Arisian, whom Kinnison spoke of as "Mentor", took inexplicable interest in him. He never interfered, but would sometimes give the Lensman advice when asked via Lens. Kinnison and Clarrissa, thinking that the war was over, decided to marry; but were stopped by Mentor. They had more work to do first.

Boskonia was again attacking, with an entirely different technique. The Big Four discovered that Lyrane II, a planet of matriarchs, was a key. Since the matriarchs would not co-operate with any males or with nonhuman entities, Kinnison obtained Mentor's permission and assistance in making Clarrissa a Second-Stage Lensman. A cavern of Overlords upon Lyrane II was found and destroyed; and upon Lyrane VIII a base of the Eich, a race of frigid-blooded, poison-breathing, pseudo-fourth-dimensional monsters—somewhat akin to the Palainians—who developed and regularly used the hyperspatial

tube. By capturing some of the Overlords and Eich and reading their minds, they learned that the Boskonian commanders were Kandron of Onlo, an Eich-like creature, and the human-type Alcon, the Tyrant of Thrale.

Kinnison took the personality of Traska Gannel, an officer of Alcon's guard, enforcing his imposture by power of mind. He killed Alcon and usurped his place; then killed one Fossten, ostensibly Alcon's Prime Minister—aided, without his knowledge, by Mentor of Arisia. Apparently human, because of his immense hypnotic powers, Fossten was actually an Arisian-like creature. Mentor made Kinnison believe that Fossten was an Arisian who had gone mad in his youth.

Now the Tyrant of Thrale, Kinnison turned the planet over to the Patrol. Nadreck penetrated Onlo's defenses by stealth and skill, and by hypnotic and psychological means forced the defenders to kill each other. Peace came. Kinnison and Clarrissa asked Mentor's permission to marry. He said: "In my visualization of the Cosmic All your marriage has now become necessary." They did not press him for an explanation and he volunteered none. Twenty years passed, with Kinnison holding the supreme office of Galactic Co-ordinator.

The Kinnisons had five children. One son, Christopher, and two pairs of identical twin daughters one year apart—Kathryn, Karen, Camilla, and Constance. These children were prodigies of a new and extraordinary kind. Kinnison and Clarrissa were in fact the penultimates of a long line; a line bred by the Arisians specifically to produce exactly these ultimates; for some purpose which only those ultimates could bear to know.

Mental ills spread throughout Civilization. Kinnison and his aides deduced that Boskonia was still trying to destroy Civilization; now by the direct use of superpowerful minds. Kit graduated as a Second-Stage Lensman—he was in reality a Third, as were his sisters, but that fact had to be concealed—and took to space. The Big Four went back into harness, each to work in his own way. Worsel hunted Overlords; Tregonsee and Camilla went after whatever "X" was perpetrating a certain type of crime; Nadreck lay in wait for Kandron, ex-ruler of Onlo. Kinnison, in foiling the abduction of the President of Radelix, was captured in a trap set specifically for him and was carried off in a spaceship via hyperspatial tube. Kathryn, in her speedster followed the Boskonian vessel into the tube and, without revealing herself, helped her father kill the crew.

Now Kinnison is about to attack the four remaining Boskonians, entrenched in the control room. Kathryn, having deduced what her father is facing, is in an agony of indecision as to how she can help him without revealing things which must forever be kept from any mind not inherently stable at the third level of stress.

Part 2

VIII.

But Kinnison's mind, while slower than his daughter's and in many respects less able, was sure. The four Boskonians in the control room were screened against his every mental force and it was idle even to hope for another such lucky break as he had just had. One was QX and to be received thankfully, but coincidences simply did not happen. They were armored by this time and they had both machine rifles and semiportable projectors. They were entrenched; evidently intending to fight a delaying and defensive battle, knowing that if they could keep the aggressor at bay until the pseudospace of the tube had been traversed, the Lensman would not have a chance. Armed with all they could use of the most powerful mobile weapons aboard and being four to one, they undoubtedly thought that they could win easily enough.

Kinnison thought otherwise. Since he could not use his mind against them he would use whatever he could find, and this ship, having come upon such a mission, would be carrying plenty of weapons—and those four men certainly hadn't had time to tamper with them all. He might even find some negative-matter bombs.

Setting up a spy-ray block, he proceeded to rummage. They couldn't see him, and, if any one of them had a sense of perception and cut his screen for even a fraction of a second to use it, the battle would end then and there. And, if they decided to rush him, so much the better. They remained, however, forted up, as he had thought that they would, and he rummaged in peace. Various death-dealing implements, invitingly set up, he ignored after one cursory glance into their interiors. He knew weapons—these had been fixed. He went on to the armory.

He did not find any negabombs, but he found plenty of untouched weapons like those now emplaced in the control room. The rifles were beauties, high-caliber, water-cooled things, each with a heavy dureum shield-plate and a single-ply screen. Each had also a beam but machine-rifle beams weren't so hot. Conversely, the semiportables had lots of screen, but very little dureum. Kinnison lugged one rifle and two semiportables, by easy stages, into the room next to the control room; so placing them that the control panels would be well out of the line of fire.

What gave Kinnison his chance was the fact that the enemies' weapons were set to cover the door. Apparently they had not considered the possibility that the Lensman would attempt to flank them by blasting through an inch and a half of alloy. Kinnison did not know whether he could do it fast enough to mow them down from the side before they could reset their magnetic clamps, or not; but he'd give it the good old college try. It was bound to be a mighty near thing, and the Lensman grinned wolfishly

behind the guard plates of his helmet as he arranged his weapons to save every possible fractional second of time.

Aiming one at a spot some three feet above the floor, the other a little lower, Kinnison cut in the full power of his semiportables and left them on. He energized the rifle's beam—every little bit helped—set the defensive screens at "full", and crouched down into the saddle behind the dureum shield. He had checked the feeds long since; he had plenty of rounds.

Two large spots and a small one smoked briefly, grew red. They turned bright red, then yellow, merged into one blinding spot. Metal melted, sluggishly at first, then thinly, then flaring, blowing out in raging coruscations of sparks as the fiercely-driven beams ate in. Through!

The first small opening appeared directly in line between the muzzle of Kinnison's rifle and one of the guns of the enemy, and in the moment of its appearance the Patrolman's weapon began its stuttering, shattering roar. The Boskonians had seen the hot spot upon the wall, had known instantly what it meant, and were working frantically to swing their gun mounts around so as to interpose their dureum shields and to bring their own rifles to bear. They had almost succeeded. Kinnison caught just the bulge of one suit of armor in his sights, but that was enough. The kinetic energy of the stream of metal tore him out of the saddle; he was literally riddled while still in air. Two savage bursts took care of the semiportables and their operators—as has been intimated, the shields of the semis were not designed to withstand the type of artillery Kinnison was using.

That made it cannon to cannon, one to one; and the Lensman knew that those two identical rifles could hammer at each other's defenses for an hour without doing any serious damage. He had, however, one big advantage. Being closer to the bulkhead he could depress his line of fire more than could the Boskonian. He did so, aiming at the clamps, which were not built to take very much of that sort of punishment. One front clamp let go, then the other, and the Lensman knew what to do about the rear pair, which he could not reach. He directed his fire against the upper edge of the dureum plate. Under the awful thrust of that terrific storm of steel the useless front clamps lifted from the floor. The gun mount, restrained from sliding by the unbreakable grip of the rear clamps, reared up. Over it went, straight backward, exposing the gunner to the full blast of Kinnison's fire. That, definitely, was that.

Kathryn heaved a sigh of relief; as far as she could "see", the tube was still empty. "That's my Pop!" she applauded inaudibly to herself. "Now", she breathed, "if the darling has just got jets enough to figure out what may be coming at him down this tube—and sense

enough to run back home before it can catch him!"

Kinnison had no suspicion at all that any danger to himself might lie within the tube. He had no desire, however, to land alone in a strange and possibly half-crippled enemy ship in the exact center of an enemy base, and no intention whatever of doing so. Moreover, he had once come altogether too close to permanent immolation in a foreign space because of the discontinuance of a hyperspatial tube while he was in it, and once was once too many. Also, he had just got done leading with his chin, and once of that, too, was once too many. Therefore, his sole thought was to get back into his own space as fast as he could get there, so as soon as the opposition was silenced he hurried into the control room and reversed the vessel's drive.

Behind him, Kathryn flipped her speedster end for end and led the retreat. She left the tube before—"before" is an extremely loose and inaccurate word in this connection, but it conveys the idea better than any other ordinary term—she got back to Base. She caused an officer to broadcast an "evacuation" warning, then hung poised high above Base, watching intently. She knew that Kinnison could not leave the tube except at its terminus, hence would have to materialize inside Base itself. She had heard of what happened when two dense, hard solids attempted to occupy the same three-dimensional space at the same time; but to view that occurrence was not her purpose in lingering. She did not actually know whether there was anything in the tube or not; but she did know that if there were, and if it or they should follow her father out into normal space, even she would have need of every jet she could muster.

Kinnison, maneuvering his Boskonian cruiser to a halt just at the barest perceptible threshold of normal space, in the intermediate zone in which nothing except dureum was solid in either space or pseudo-space, had already given a great deal of thought to the problem of disembarkation. The ship was small, as spaceships go, but even so it was a lot bigger than any corridor of Base. Those corridor walls and floors were thick and contained a lot of steel; the ship's walls were solid alloy. He had never seen metal materialize within metal and, frankly, he didn't want to be around, even inside D-armor, when it happened. Also, there were a lot of explosives aboard, and atomic power plants, and the chance of touching off a loose atomic vortex in the very middle of Base and within a few feet of himself was not one to be taken lightly.

He had already rigged a line to a master switch. Power off, with the ship's dureum catwalk as close to the floor of the corridor as the dimensions of the tube permitted, he reversed the controls and poised himself for the running headlong dive. He could not feel Radeligian gravitation, of course, but he was pretty sure that he could leap far enough to get through the interface. He took a short run, jerked the line,

and hurled himself through the spaceship's immaterial wall. The ship disappeared.

Going through that interface was more of a shock than the Lensman had anticipated. Even taken very slowly, as it customarily is, interdimensional acceleration brings malaise to which no one has ever become accustomed, and taking it so rapidly fairly turned Kinnison inside out. He was going to land with the rolling impact which constitutes perfect technique in such armored maneuvering. As it was, he never did know how he landed, except that he made a boiler-shop racket and that he brought up against the far wall of the corridor with a climactic clang. Beyond the addition of a few more bruises and contusions to his already abundant collection, however, he was not harmed.

As soon as he could collect himself he leaped to his feet and rapped out orders. "Tractors—pressors—shears! Heavy stuff, to anchor, not to clamp! Hipe!" He knew what he was up against now, and, if they'd just come back, he'd yank them out of that tube so fast it'd break their neck!

And Kathryn, still watching intently, smiled. Her Dad was a pretty smart old duck, but he wasn't using his noggin now—he was cockeyed as Trenco's ether in thinking that they might come back. If anything at all erupted from that hypercircle, it would be something against which the stuff he was mustering would be precisely as effective as so much thin air. And she *still* had no concrete idea of what she so feared. It would not be essentially physical, she was pretty sure. It would almost have to be mental. But who or what could possibly put it across? And how? And above all, what could she do about it if they did?

Eyes narrowed, brow furrowed in concentration, she thought as she had never thought before; and the harder she thought the more clouded the picture became. For the first time in her triumphant life she felt small—weak—impotent. It was in that hour that Kathryn Kinnison really grew up.

The tube vanished; she heaved a tremendous sigh of relief. They, whoever they were, having failed to bring Kinnison to them—this time—were not coming after him—this time. Not an important enough game to play to the end? No, that wasn't it. Maybe they weren't ready. But the next time—

Mentor the Arisian had told her bluntly, the last time she had seen him, to come to him again when she had found out that she did not know everything there was to be known. Deep down, she had believed that that day would never come. Now, however, it had. This escape—if it had been an escape—had taught her much.

"Mother!" She shot a call to distant Klovia. "I'm on Radelix. Everything's on the green. Dad has just knocked a flock of Boskonians into an outside loop and come through QX. I've got to do a

little flit, though, before I come home. 'Bye."

Kinnison stood intermittent guard over Base for four days after the hyperspatial tube had disappeared before he gave up; before he did any very serious thinking upon what he should do next.

Could he and should he keep on as Sybly Whyte? He could and he should, he decided. He hadn't been gone long enough for Whyte's absence to have been noticed; nothing whatever connected Whyte with Kinnison. If he really knew what he was doing, a more specific alias might be better; but as long as he was merely smelling around, Whyte's was the best identity to use. He could go anywhere, do anything, ask anything of anybody, and all with a perfectly good excuse.

And as Sybly Whyte, then, for days that stretched into weeks, he roamed—finding, as he had been afraid that he would find, nothing whatever. It seemed as though all Boskonian activity of the type in which he was most interested had ceased with his return from the hyperspatial tube. Just what that meant he did not know. It was unthinkable that they had given up on him—much more probably they were hatching something brand-new. And the frustration of inaction and the trying to figure out what was coming next was driving him not-so-slowly nuts.

Then, striking through the doldrums, came a call from Maitland.

"Kim? You told me to Lens you immediately about any off-color work. Don't know whether this is or not. The guy may be—probably is—crazy. Conklin, who reported him, couldn't decide—neither can I, from Conklin's report. Do you want to send somebody special, take over yourself, or what?"

"I'll take over," Kinnison decided instantly. If neither Conklin nor the Vice Co-ordinator, Gray Lensmen both, could decide, there was no point in sending anyone else. "Where and who?"

"Planet, Meneas II, not too far from where you are now. City, Meneateles; 116-3-29, 45-22-17. Place, Jack's Haven, a meteor miner's hangout at the corner of Gold and Sapphire Streets. Person, a man called 'Eddie'."

"Thanks. I'll check." Maitland did not send, and Kinnison did not want, any additional information. Both knew that since the Co-ordinator was going to investigate this thing himself, he should get his facts, and particularly his impressions, unprejudiced and at first hand.

To Meneas II, then, and to Jack's Haven, Sybly Whyte went, notebook very much in evidence. An ordinary enough space-dive Jack's turned out to be—higher-toned than that Radeligian space-dock saloon of Bominger's; much less flamboyant than notorious Miners' Rest on far Euphrosyne.

"I wish to interview a person named Eddie," he announced, as he bought a bottle of wine. "I have been informed that he has had deep-space adventures worthy of incorporation into one of my novels."

"Eddie? Haw!" The barkeeper

laughed raucously. "That space-louse? Somebody's been kidding you, mister. He's nothing but a broken-down meteor miner—you know what a space-louse is, don't you?—that we let clean cuspidors and do such-like odd jobs for his keep. We don't throw him out, like we do the others, because he's kind of funny in one way. Every hour or so he throws a fit, and that amuses people."

Whyte's eager-beaver attitude did not change; his face reflected nothing of what Kinnison thought of this callous speech. For Kinnison did know exactly what a space-louse was. More, he knew exactly what turned a man into one. Ex-meteor miner himself, he knew what the awesome depths of space, the ever-present dangers, the privations, the solitude, the frustrations, did to any mind not adequately integrated. He knew that only the strong survived; that the many weak succumbed. From sickening memory he knew just what pitiful wrecks those many became. Nevertheless, and despite the fact that the information was not necessary:

"Where is this Eddie now?"

"That's him, over there in the corner. By the way he's acting, he'll have another fit pretty quick now."

The shambling travesty of a man accepted avidly the invitation to table and downed at a gulp the proffered drink. Then, as though the mild potion had been a trigger, his wracked body tensed and his features began to writhe.

"Cateagles!" he screamed; eyes rolling, breath coming in hard, frantic gasps. "Gangs of cat-eagles! Thousands! They're clawing me to bits! And the Lensman! He's sicking them on! OW!! Yow!!!" He burst into unintelligible screams and threw himself to the floor. There, rolling convulsively over and over, he tried the impossible feat of covering simultaneously with his two clawlike hands his eyes, ears, nose, mouth, and throat.

Ignoring the crowding spectators, Kinnison invaded the helpless mind before him. He winced mentally as he photographed upon his own brain the whole atrocious enormity of what was there. Then, while Whyte busily scribbled notes, he shot a thought to distant Klovia.

"Cliff! I'm here in Jack's Haven, and I've got Eddie's data. What did you and Conklin make of it? You agree, of course, that the Lensman is the crux."

"Definitely. Everything else is hop-happy space-drift. The fact that there are not—there *can't* be—any such Lensman as Eddie imagined, makes him space-drift, too, in our opinion. We called you in on the millionth chance—sorry that we sent you out on a false alarm, but you said we had to be sure."

"You needn't be sorry." Kinnison's thought was the grimmest Clifford Maitland had ever felt. "Eddie isn't an ordinary space-louse. You see, I happen to know one thing that you and Conklin

don't, since you've never been there. Did you happen to notice a woman in the picture? Very faint; decidedly in the background?"

"Now that you mention her—yes, there was one. So far in the background and so faint that it never occurred to either Conklin or me that she could be connected. How can she possibly have any bearing, Kim? Most every spaceman has a woman—or a lot of different ones—more or less on his mind all the time, you know. Definitely immaterial and not germane, I'd say."

"So would I, maybe, except for the fact that she isn't really a woman at all, but a Lyranian—"

"A LYRANIAN!" Maitland interrupted. Kinnison could feel the racing of his assistant's thoughts. "That complicates things. But how in Palain's purple hells, Kim, could Eddie ever have got to Lyrane—and if he did, how did he get away alive?"

"I don't know, Cliff." Kinnison's mind, too, was working fast. "But you haven't got all the dope yet. Not only is she a Lyranian, but I know her personally—she's that airport manager who tried her level best to kill me all the time I was on Lyrane II."

"Hm-m-m." Maitland tried to digest that undigestible bit. Tried, and failed. "That would seem to make the Lensman real, too, then—real enough, at least, to investigate—much as I hate to think of the possibility of a Lensman going that far off the beam." Maitland's convictions died hard. "Unless—could there be any possibility of coincidence?"

"Coincidence is out. Don't think it's a trap, either—hasn't got the right earmarks."

"You'll handle this yourself, then?"

"Check. At least, I'll help. There may be people better qualified than I am to do the heavy work. I'll get them at it. Thanks, Cliff—clear ether."

He lined a thought to his wife; and after a short, warmly intimate contact, he told her everything that had happened.

"So you see, Beautiful," he concluded, "your wish is coming true. I couldn't keep you out of this if I wanted to. So check with the girls, put on your Lens, take off your clothes, and go to work."

"I'll do that." Clarrissa laughed and her soaring spirit flooded his mind. "Thanks, my dear."

Then and only then did Kimball Kinnison, master therapist, pay any further attention to that which lay contorted upon the floor. But when Whyte folded up his notebook and left the place, the derelict was resting quietly; and in a space of time long enough so that the putative writer of space operas would not be connected with the cure, those fits would end. Moreover, Eddie would return, whole, to the void: he would become what he had never before been—a successful meteor miner.

Lensmen pay their debts; even to spiders and to worms.

IX.

Her adventure in the hyperspatial tube had taught Kathryn Kinnison much. Realizing her inadequacy and knowing what to do about it, she drove her speedster at high velocity to Arisia. Unlike the Second-Stage Lensmen, she did not even slow down as she approached the planet's barrier; but, as one sure of her welcome, merely threw out ahead of her an identifying thought.

"Ah, daughter Kathryn, again you are in time." Was there, or was there not, a trace of emotion—of welcome, even of affection?—in that usually utterly emotionless thought? "Land as usual."

She neutralized her controls as she felt the mighty beams of the landing engine take hold of her little ship. Upon previous visits she had questioned nothing—this time she was questioning *everything*. Was she landing, or not? Directing her every force inwardly, she probed her own mind to its profoundest depths. Definitely, she was her own mistress throughout—no conceivable mind could take *hers* over so tracelessly. As definitely, then, she was actually landing.

She landed. The ground upon which she stepped was real. So was the automatic flier—neither plane nor helicopter—which whisked her from the spaceport to her familiar destination, an unpretentious residence upon the grounds of an immense hospital. The graveled walk, the flowering shrubs, and the indescribably sweet and pungent perfume were real; as were the tiny pain and the drop of blood which resulted when a needle-sharp

thorn pierced her incautious finger.

Through automatically opening doors she made her way into the familiar, comfortable, book-lined room which she knew was Mentor's study. And there, at his big desk, unchanged, sat Mentor. A lot like her father, but older—much older. About ninety, she had always thought, even though he didn't look over sixty. This time, however, she drove a probe—and got the shock of her life. Her thought was stopped—cold—not by superior mental force, which she could have taken unmoved, but by a seemingly ordinary thought-screen; and her fast-disintegrating morale began visibly to crack.

"Is all this . . . are you . . . real, or not?" she burst out, finally. "If it isn't, I'll go mad!"

"That which you have tested—and I—are real, for the moment and as you understand reality. Your mind in its present state of advancement cannot be deceived concerning such elementary matters."

"But it all wasn't, before? Or don't you want to answer that?"

"Since the sure knowledge will affect your growth, I will answer. It was not. This is the first time that your speedster has landed physically upon Arisia."

The girl shrank, appalled. "You told me to come to you again when I had learned that I did not know everything there was to know," she finally forced herself to say. "I learned that in the tube; but I did not realize until just now that I don't know *anything*. Do you really think, Mentor, that there is any use at all in going on with me?" she concluded, bitterly.

"Much," he assured her. "Your development has been eminently satisfactory, and your present mental condition is both necessary and sufficient."

"Well, I'll be a spr—" Kathryn bit off the expletive and frowned. "What were you doing to me before, then, when I thought I got everything?"

"Power of mind," he informed her. "Sheer power, and penetration, and control. Depth, and speed, and all the other factors with which you are already familiar."

"But what is left? I know there is—lots of it—but I can't imagine what."

"Scope," Mentor replied, gravely. "Each of those qualities and characteristics must be expanded to encompass the full sphere of thought. Neither words nor thoughts can give any adequate concept of what it means; a practically wide-open two-way will be necessary. This cannot be accomplished, daughter, in the adolescent confines of your present mind; therefore enter fully into mine."

She did so: and after less than a minute of that awful contact slumped to the floor.

The Arisian, unchanged, unmoved, unmoving, gazed at her until finally she began to stir.

"That . . . father Mentor, that was—" she blinked, shook her head savagely, fought her way back to

full consciousness. "That was a shock."

"It was," he agreed. "More so than you think. Of all the entities of your Civilization, your brother and now you are the only ones it would not kill instantly. You now know what the word 'scope' means, and are ready for your last treatment, in the course of which I shall take your mind as far along the road of knowledge as mine is capable of going."

"But that would mean . . . you're implying—But my mind *can't* be superior to yours, Mentor! Nothing could be, *possibly*—it's sheerly, starkly unthinkable!"

"But true, daughter, nevertheless. While you are recovering your strength from that which was but the beginning of your education, I will explain certain matters previously obscure. You have long known, of course, that you five children are not like any others. You have always known many things without having learned them. You think upon all possible bands of thought. Your senses of perception, of sight, of hearing, of touch, are so perfectly merged into one sense that you perceive at will any possible manifestation upon any possible plane or dimension of vibration. Also, although this may not have occurred to you as extraordinary, since it is not obvious, you differ physically from your fellows in some important respects. You have never experienced the slightest symptom of physical illness; not even a headache or a decayed tooth. You do not really require sleep. Vaccinations and inoculations do not 'take'. No pathogenic organism, however virulent; no poison, however potent—"

"Stop, Mentor!" Kathryn gasped, turning white. "I can't take it . . . you really mean, then, that we aren't human at all?"

"Yes and no. A partial explanation, while long, may be in order. Many cycles of time ago it became apparent to our more advanced thinkers that the rise and fall of Civilizations was too rhythmic to be accidental. They studied this rhythm, but life was too short. They set out, then, deliberately to prolong their lives. Fewer and fewer in numbers, they lived longer and longer; and the longer each lived, the more he learned. Their visualizations of the Cosmic All became less tenuous, more complete. It became evident that there was some inimical force at work; a force implacably opposed to that which we know as Civilization. Like a mouse in the power of a torturing cat, any Civilization could go just so far, but no farther. For instance, that of Atlantis, upon your father's native planet, Tellus. I was personally concerned in that, and could not stop its fall." The Arisian *was* showing emotion now; his thought was bleak and bitter.

"Four of us were assigned to the problem of this opposing force. We learned that its final abatement would necessitate the development of a race superior to ours in every respect. We, therefore, selected blood lines in each of the four strongest races of the galaxy and

began to eliminate as many as possible of their weaknesses and to concentrate all of their strengths. From your knowledge of genetics you realize the magnitude of the task; you know that it would take much time uselessly to go into the details of its accomplishment. Your father and your mother were the penultimates of long—*very* long—lines of matings; their procreative cells were such that in their fusion practically every gene carrying any trait of weakness was rejected. Conversely, you carry the genes of every trait of strength ever known to any member of your human race. Therefore, while in outward seeming you are human, in every factor of importance you are not; you are even less human than am I myself."

"And just how human is that?" Kathryn flared, and again her most penetrant probe of force flattened out against the Arisian's screen.

"Later, daughter, not now. That knowledge will come at the end of your education, not at its beginning."

"I was afraid so." She stared at the Arisian, her eyes wide and hopeless; brimming, in spite of her efforts at control, with tears. "You're a monster, and I am . . . or am going to be . . . a worse one. A monster . . . and I'll have to live a million years . . . alone . . . why? *Why*, Mentor, did you have to do this to me?"

"Calm yourself, daughter. The shock, while severe, will pass. You have lost nothing, have gained much."

"Gained? Bah!" The girl's thought was loaded with bitterness and scorn. "I've lost my parents—I'll still be a girl long after they have died. I've lost every possibility of ever really living. I want love . . . and a husband . . . and children . . . and I can't have any of them, ever. Even without this, I've never seen a man I wanted, and now I can't ever love anybody. I don't *want* to live a million years, Mentor—especially alone!" The thought was a veritable wail of despair.

"The time has come to stop this childish thinking." Mentor's thought, however, was only mildly reproving. "Such a reaction is only natural, but your conclusions are entirely erroneous. One single clear thought will show you that you have no present psychic, intellectual, emotional, or physical need of a complement."

"That's true—But other girls of my age—"

"Exactly," came Mentor's dry rejoinder. "Thinking of yourself as an adult Homo sapien, you were judging yourself by false standards. As a matter of fact, you are an adolescent, not an adult. In due time you will come to love a man, and he you, with a fervor and depth which you at present cannot even dimly understand."

"But that still leaves my parents," Kathryn felt much better. "I can apparently age, of course, as easily as I can put on a hat . . . but I really do love them, you know, and

it will simply break mother's heart to have all her daughters turn out to be—as she thinks—spinsters."

"On that point, too, you may rest at ease. I am taking care of that. Kimball and Clarrissa both know, without knowing how they know it, that your life cycle is tremendously longer than theirs. They both know that they will not live to see their grandchildren. Be assured, daughter, that before they pass from this cycle of existence into the next—about which I know nothing—they shall know that all is to be supremely well with their line; even though, to Civilization at large, it shall apparently end with you Five."

"End with us?. What do you mean?"

"You have a destiny, the nature of which your mind is not yet qualified to receive. In due time the knowledge shall be yours. Suffice it now to say that the next forty or fifty years will be but a fleeting moment in the span of life which is to be yours. But time, at the moment, presses. You are now fully recovered and we must get on with this, your last period of study with me, at the end of which you will be able to bear the fullest, closest impact of my mind as easily as you have heretofore borne full contact with your sisters'. Let us proceed with the work."

Work it was, and it went on for weeks. Kathryn took and survived those shattering treatments, one after another; emerging finally with a mind whose power and scope can no more be explained to any mind below the third level than can the general theory of relativity be explained to a chimpanzee.

"It was forced, not natural, yes," The Arisian said, gravely, as the girl was about to leave. "You are many millions of your years ahead of your natural time. You realize, however, the necessity of that forcing. You also realize that I can give you no more formal instruction. I will be with you or on call at all times; I will be of aid in crises; but in larger matters your further development is in your own hands."

Kathryn shivered. "I realize that, and it scares me clear through—especially this coming conflict, at which you hint so vaguely. I wish that you would tell me at least *something* about it, so that I could get ready for it!"

"Daughter, I can't." For the first time in Kathryn's experience, Mentor the Arisian was unsure. "It is certain that we have been on time; but since the Eddorians have minds of power little, if any, inferior to our own, there are many details which we cannot derive with certainty, and to advise you wrongly would be to do you irreparable harm. All I can say is that if my visualization in that respect is sound, and I am practically sure that it is, sufficient warning will be given by your learning, with no specific effort on your part and from some source other than myself, that there does in fact exist a planet named 'Ploor'—a name which to you is now only a meaningless symbol.

Go now, daughter Kathryn, and work."

Kathryn went; knowing that the Arisian had said all that he would say. In truth, he had told her vastly more than she had expected him to divulge; and it chilled her to the marrow to think that she, who had always looked up to the Arisians as demigods of sorts, would from now on be expected to act as their equal—in some ways, perhaps, as their superior! As her speedster tore through space toward distant Klovia she wrestled with herself, trying to shake her new self down into a personality as well integrated as her old one had been. She had not quite succeeded when she felt a thought.

"Help! I am in difficulty with this, my ship. Will any entity receiving my call and possessing the tools of a mechanic please come to my assistance? Or, lacking such tools, possessing a vessel of power sufficient to tow mine to the place where I must immediately go?"

Kathryn was startled out of her introspective trance. That thought was on a terrifically high band; one so high that she knew of no race using it, so high that an ordinary human mind could not possibly have either sent or received it. Its phraseology, while peculiar, was utterly precise in definition—the mind behind it was certainly of precisionist grade. She acknowledged upon the stranger's wave, and sent out a locator. Good—he wasn't far away. She flashed toward the derelict, matched intrinsics at a safe distance, and began scanning, only to encounter a screen around the whole vessel! To her it was porous enough—but if the creature thought that his screen was tight, let him keep on thinking so. It was his move.

"Well, what are you waiting for?" The thought fairly snapped. "Come closer, so that I may bring you in."

"Not yet," Kathryn snapped back. "Cut your screen so that I can see what you are like. I carry equipment for many environments, but I must know what yours is and equip for it before I can come aboard. You will note that my screens are down."

"Of course. Excuse me—I supposed that you were one of our own"—there came the thought of an unspeilable and unpronounceable name—"since none of the lower orders can receive our thoughts direct. Can you equip yourself to come aboard with your tools?"

"Yes." The stranger's light was fierce stuff; ninety-eight percent of its energy being beyond the visible. His lamps were beam-held atomics, nothing less, but there was very little gamma and few neutrons. She could handle it easily enough, she decided, as she finished donning her heat-armor and a helmet of practically opaque, diamond-hard plastic.

As she was wafted gently across the intervening space upon a pencil of force, Kathryn took her first good look at the precisionist himself—or herself. She—it—looked something like a Dhilian, she

thought at first. There was the squat, powerful, elephantine body with its four stocky legs; the tremendous double shoulders and enormous arms; the domed, almost immobile head. But there the resemblance ended. There was only the one head—the thinking head, and that one had no eyes and was not covered with bone. There was no feeding head—the thing could neither eat nor breathe. There was no trunk. And what a skin!

It was worse than a hide, really—worse even than a Martian's. The girl had never seen anything like it. It was incredibly thick, dry, pliable; filled minutely with cells of a liquid-gaseous something which she knew to be a more perfect insulator even than the fibers of the tegument itself.

"R-T-S-L-Q-P." She classified the creature readily enough to six places, then stopped and wrinkled her forehead. "Seventh place—that incredible skin—what? S? R? T? It would have to be R.

"You have the requisite tools, I perceive," the creature greeted Kathryn as she entered the central compartment of the strange speedster, no larger than her own. "I can tell you what to do, if—".

"I know what to do." She unbolted a cover, wrought briefly with pliers and splicer, and in ten minutes was done. "It doesn't seem to make sense to me that a person of your obvious intelligence, manifestly knowing enough to make such minor repairs yourself, would go so far from home, alone in such a small ship, without any tools. Burnouts and shorts are apt to happen any time, you know."

"Not in vessels of the—." Again Kathryn felt that unpronounceable symbol. She also felt the stranger stiffen in offended dignity. "We of the higher orders, you should know, do not perform labor. We think. We direct. Others work, and do their work well, or suffer accordingly. This is the first time in nine full four-cycle periods that such a thing has happened, and it will be the last. The punishment which I shall mete out to the guilty mechanic will insure that. I shall, at end, have his life."

"Oh, come, now!" Kathryn protested. "Surely it's no life-and-death mat—"

"Silence!" came curt command. "It is intolerable that one of the lower orders should attempt to—"

"Silence yourself!" At the fierce power of the riposte the creature winced, physically and mentally. "I did this bit of dirty work for you because you apparently couldn't do it for yourself. I did not object to the matter-of-course way you accepted it, because some races are made that way and can't help it. But if you insist on keeping yourself placed five rungs above me on any ladder you can think of, I'll stop being a lady—or even a good Girl Scout—and start doing things about it, and I'll start at any signal you care to call. Get ready, and say when!"

The stranger, taken fully aback, threw out a lightning tentacle of thought; a feeler which was stopped

cold a full foot from the girl's radiant armor. This was a human female—or was it? It was not. No human being had ever had, nor ever would have, a mind like that. Therefore:

"I have made a grave error," the thing apologized handsomely, "in thinking that you are not at least my equal. Will you grant me pardon, please?"

"Certainly—if you don't repeat it. But I still don't like the idea of your having that mechanic skinned alive." She thought intensely, lip caught between strong white teeth. "Perhaps there is a way. Where are you going, and when do you want to get there?"

"To my home planet," pointing out, mentally, its location in the Galaxy. "I must be there in two hundred of your G-P hours."

"I see." Kathryn nodded her head. "You can—if you promise that you will do nothing whatever to punish your mechanic. And remember that I can tell whether you really mean it or not."

"As I promise, so I do. But suppose that I do not promise?"

"In that case you'll get there in about a hundred thousand G-P years, frozen stiff. For I shall fuse your Bergenholm down so that it can't ever be fixed; then, after welding your ports solidly to the outer shell, I'll attach to your plating the generator of a screen through which you cannot think. Since you have no tools, I'll leave the rest to your imagination. Decide, now, what you wish to do."

"I promise not to harm the mechanic in any way." He surrendered stiffly, and made no undue protest at Kathryn's entrance into his mind to make sure that the promise would be kept.

Flushed by her easy conquest of a mind which she would previously have been unable to touch, and engrossed in the problem of setting her own tremendously enlarged mind to rights, why should it have occurred to the girl that there was anything worthy of investigation concealed in the depths of that chance-met stranger's mentality?

Returning to her own speedster, she shed her armor and shot away; and it was just as well for her peace of mind that she was not aware of the tight-beamed thought even then speeding from the flitter so far behind her to dread and distant Ploor.

". . . but it was very definitely not a human female. I could not touch it. It may very well have been one of the accursed Arisians themselves. But since I did nothing to arouse its suspicions, I got rid of it easily enough. Spread the warning!"

X.

While Kathryn Kinnison was working with her father in the hyperspatial tube and with Mentor of Arisia, and while Camilla and Tregonsee were sleuthing the inscrutable "X", Constance was also at work. Although she lay flat upon her back, not moving a muscle, she was working as she had never worked before. Long since she had put her indetectable speedster into

the control of a director-by-chance. Now, knowing nothing and caring less of where she and her vessel might be or might go, physically completely relaxed, she drove her "sensories" out to the full limit of their prodigious range and held them there for hour after hour. Worsel-like, she was not consciously listening for any particular thing; she was merely increasing her already incredibly vast store of knowledge. One hundred percent receptive, attached to and concerned with only the brain of her physical body, her mind sped at large sampling, testing, analyzing, cataloguing every item with which its most tenuous fringe came in contact. Through thousands of solar systems that mind went; millions upon millions of entities either did or did not contribute something worth while.

Suddenly there came something that jarred her into physical movement—a burst of thought upon a band so high that it was practically always vacant. She shook herself, got up, lighted an Alsakanite cigarette, and made herself a pot of coffee.

"This is important, I think," she mused. "I'd better get to work on it while it's fresh."

She sent out a thought tuned to Worsel, and was surprised when it went unanswered. She investigated, finding that the Velantian's screens were full up and held hard—he was fighting Overlords so savagely that he had not felt her thought. Should she take a hand in this brawl? She should not, she decided, and grinned fleetingly. Her erstwhile tutor would need no help in that comparatively minor chore. She would wait, rest up a bit, and eat, before she called him.

"Worsel! Con calling. What goes on there, fellow old snake?" She finally launched her thought. "You've stuck that sharp tail of yours into some of my business—I hope."

"I hope so," Worsel sent back. "Been quite a while since I saw you close up—how about coming aboard?"

"Coming at max," and she did.

Before entering the *Velan,* however, she put on a personal gravity damper, set at nine hundred eighty centimeters. Strong, tough, and supple as she was she did not relish the thought of the atrocious accelerations used and enjoyed by Velantians everywhere.

"What did you make of that burst of thought?" she asked by way of greeting. "Or were you having so much fun that you missed it?"

"What burst?" Then, after Constance had explained, "I was busy—but *not* having fun."

"Somebody who didn't know you might believe that," the girl derided. "This thought was important, I think—much more so than dilly-dallying with Overlords, as you were doing. It was 'way up—on this band here." She illustrated.

"So?" Worsel came as near to whistling as one of his inarticulate race could come. "What were they like? Tell me all that you can."

"VWZY, to four places." Con concentrated "Multilegged — not exactly carapaceous, but pretty nearly. Spiny, too, I believe. The world was cold, dismal, barren; but not frigid, but he . . . it . . . didn't seem exactly like an oxygen-breather—more like what a warm-blooded Palainian would perhaps look like, if you can imagine such a thing. Mentality very high—precisionist grade—no thought of cities as such. The sun was a typical yellow dwarf. Does any of this ring a bell in your mind?"

"No." Worsel thought intensely for minutes. So did Constance. Neither had any idea then that the girl was describing the form assumed in their autumn by the dread inhabitants of the planet Ploor!

"This may indeed be important," Worsel broke the mental silence. "Shall we explore together?"

"We shall." They tuned to the desired band. "Give it plenty of shove, too. Go!"

Out and out and out the twinned receptors sped; to encounter finally a tenuous, weak, and utterly cryptic vibration. One touch—the merest possible contact—and it disappeared. It vanished before even Con's electronics-fast reactions could get more than a hint of directional alignment; and neither of the observors could read any part of it.

Both of these developments were starkly incredible, and Worsel's long body tightened convulsively, rock-hard, in the violence of the mental force now driving his exploring mind. Finding nothing, he finally relaxed.

"Any Lensman, anywhere, can read and understand any thought, however garbled or scrambled, or however expressed," he thought at Constance. "Also, I have always been able to get an exact line on anything I could perceive, but all I know about this one is that it seemed to come mostly from somewhere over that way. Did you do any better?"

"Not much, if any." If the thing was surprising to Worsel, it was sheerly astounding to his companion. She, knowing the measure of her power, thought to herself—not to the Velantian: "Girl, file *this* one carefully away in the big black book!"

Slight as were the directional leads, the *Velan* tore along the indicated line at maximum blast. Day after day she sped, a wide-flung mental net out far ahead and out farther still on all sides. They did not find what they sought, but they did find—something.

"What is it?" Worsel demanded of the quivering telepath who had made the report.

"I don't know, sir. Not on that ultra-band, but well below it—there. Not an Overlord, certainly, but something perhaps equally unfriendly."

"An Eich!" Both Worsel and Con exclaimed the thought, and the girl went on, "It was practically certain that we couldn't get them all on Jarnevon, of course, but none have been reported before. Where are they, anyway? Get me

a chart, somebody. Its Novena, and they're on the ninth planet out—Novena IX. Tune up your heavy artillery, Worsel—it'd be nice if we could take the head man alive, but that much luck probably isn't in the cards."

The Velantian, even though he had issued instantaneously the order to drive at full blast toward the indicated planet, was momentarily at a loss. Kinnison's daughter entertained no doubts as to the outcome of the encounter she was proposing—but she had never seen an Eich close up. He had. So had her father. Kinnison had come out a very poor second in that affair, and Worsel knew that he could have done no better, if as well. However, that had been upon Jarnevon, actually inside one of its strongest citadels, and neither he nor Kinnison had been prepared.

"What's the plan, Worsel?" Con demanded, vibrantly. "How're you figuring on taking 'em?"

"Depends on how strong they are. If it's a long-established base, we'll simply have to report it to LaForge and go on about our business. If, as seems more probable from the fact that it hasn't been reported before, it is a new establishment of refugees from Jarnevon—or possibly only a grounded spaceship so far—we'll go to work on them ourselves. We'll soon be close enough to find out."

"QX", and a fleeting grin passed over Con's vivacious face. For a long time she had been working with Mentor the Arisian, specifically to develop the ability to "out-Worsel Worsel", and now was the best time she ever would have to put her hard schooling to test.

Hence, Master of Hallucination though he was, the Velantian had no hint of realization when his Klovian companion, working through a channel which he did not even know existed, took control of every compartment of his mind. Nor did the crew, in particular or *en masse,* suspect anything amiss when she performed the infinitely easier task of taking over theirs. Nor did the unlucky Eich, when the flying *Velan* had approached their planet closely enough to make it clear that their establishment was indeed a new one, being built around the nucleus of a crippled Boskonian battleship. Except for their commanding officer they died then and there—and Con was to regret bitterly, later, that she had made this engagement such a one-girl affair.

The battleship apparently was not in shape to meet the *Velan* in open space, since it did not; but it could have operated and to all seeming did operate as a formidable fortress indeed from its fixed position on the ground. Under the fierce impact of its offensive beams the Velantians saw their very wall shields flame violet. In return they saw their mighty secondary beams stopped cold by the Boskonian's inner screens, and had to bring into play the inconceivable energies of their primaries before the enemy's spaceship-fortress could be knocked out. And this much of the battle

for the opportunity of spending the next ten years floating around in an orbit, doing nothing. However, I check you to a certain extent—when and if anything really happens, shoot me a thought and I'll rally 'round."

The linkage broke without formal adieus. Nadreck went his way, Karen went hers. She did not, however, go far along the way she had had in mind. She was still precisely nowhere in her quest when she felt a thought, of a type that only her brother or an Arisian could send. It was Kit.

"Hi, Kay!" A warm, brotherly contact. "How'r'ya doing, Sis? Are you growing up?"

"I'm grown up! What a question!"

"Don't get stiff, Kay, there's method in this. Got to be sure." All trace of levity gone, he probed her unmercifully. "Not too bad, at that, for a kid. As Dad would express it, if he could feel you this way, you're twenty-nine numbers Brinnell harder than a diamond drill. Plenty of jets for this job, and by the time the real one comes, you'll probably be ready."

"Cut the rigmarole, Kit!" she snapped, and hurled a vicious bolt of her own. If Kit did not counter it as easily as he had handled her earlier efforts, he did not reveal the fact. "What job? What d'you think you're talking about? I'm on a job now that I wouldn't drop for Nadreck, and I don't think that I'll drop it for you."

"You'll have to." Kit's thought was grim. "Mother is going to have to go to work on Lyrane II. The probability is pretty certain that there is or will be something there that she can't handle. Remote control is out, or I'd do it myself, but I can't work on Lyrane II in person. Here's the whole picture—look it over. You can see, Sis, that you're elected, so hop to it."

"I won't!" she stormed. "I can't —I'm too busy. How about asking Con, or Kat, or Cam?"

"They don't fit the picture," he explained patiently—for him. "In this case hardness is indicated, as you can see for yourself."

"Hardness, phooey!" she jeered. "To handle Ladora of Lyrane? She thinks she's a hard-boiled egg, I know, but—"

"Listen, you bird-brained knothead!" Kit cut in, venomously. "You're fogging the issue deliberately—stop it! I spread you the whole picture—you know as well as I do that while there's nothing definite as yet, the thing needs covering and you're the one to cover it. But no—just because I'm the one to suggest or ask anything of you, you've always got to go into that mulish act of yours."

"Be silent, children, and attend!" Both flushed violently as Mentor came between them. "Some of the weaker thinkers here are beginning to despair of you, but my visualization of your development is still clear. To mold such characters as yours sufficiently, and yet not too much, is a delicate task indeed: but one which must and shall be done. Christopher, come to me at once, in person. Karen, I would suggest that you go to Lyrane and do there whatever you find necessary to do."

"I won't—I've *still* got this job here to do!" Karen defied even the ancient Arisian sage.

"That, Daughter, can and should wait. I tell you solemnly, as a fact, that if you do not go to Lyrane you will never get the faintest clue to that which you now seek."

XII.

Christopher Kinnison drove toward Arisia, seething. Why couldn't those sisters of his have sense to match their brains—or why couldn't he have had some brothers? Especially—right now—Kay. If she had the sense of a Zabriskan fontema, she'd know that this job was *important* and would snap into it, instead of wild-goose-chasing all over space. If he were Mentor, he'd straighten her out. He had decided to straighten her out once himself, and he grinned wryly to himself at the memory of what had happened. What Mentor had done to him, before he even got started, was really rugged. What he would like to do, next time he got within reach of her, was to shake her until her teeth rattled.

Or would he? Uh-uh. By no stretch of the imagination could he picture himself hurting any one of them. They were swell kids—in fact, the finest people he had ever known. He had rough-housed and wrestled with them plenty of times, of course—he liked it, and so did they. He could handle any one of them—he surveyed without his usual complacence his two-hundred-plus pounds of meat, bone, and gristle—he ought to be able to, since he outweighed them by fifty or sixty pounds: but it wasn't easy. Worse than Valerians—just like taking on a combination of boa constrictor and cateagle—and when Kat and Con ganged up on him that time they mauled him to a pulp in nothing flat.

But jet back! Weight wasn't it, except maybe among themselves. He had never met a Valerian yet whose shoulders he couldn't pin flat to the mat in a hundred seconds, and the very smallest of them outweighed

him two to one. Conversely, although he had never thought of it before, what his sisters had taken from him, without even a bruise, would have broken any ordinary woman up into a mess of compound fractures. They were—they must be—made of different stuff.

His thoughts took a new tack. The kids were special in another way, too, he had noticed lately, without paying it any particular attention. It might tie in. They didn't *feel* like other girls. After dancing with one of them, other girls felt like robots made out of putty. Their flesh *was* different. It was firmer, finer, infinitely more responsive. Each individual cell seemed to be endowed with a flashing, sparkling life; a life which, interlinking with that of one of his own cells, made their bodies as intimately one as were their perfectly synchronized minds.

But what did all this have to do with their lack of sense? QX, they were nice people. QX, he couldn't beat their brains out, either physically or mentally. But there ought to be *some* way of driving some ordinary common sense through their fine-grained, thick, hard, tough skulls!

Thus it was that Kit approached Arisia in a decidedly mixed frame of mind. He shot through the barrier without slowing down and without notification. Inerting his ship, he fought her into an orbit around the planet. The shape of the orbit was immaterial, as long as its every inch was well inside Arisia's innermost screen. For young Kinnison knew precisely what those screens were and exactly what they were for. He knew that distance of itself meant nothing—Mentor could give anyone either basic or advanced treatments just as well from a distance of a thousand million parsecs as at hand to hand. The reason for the screens and for the personal visits was the existence of the Eddorians, who had minds probably as capable as the Arisians' own. And throughout all the infinite reaches of the macrocosmic Universe, only within these highly special screens was there *certainty* of privacy from the spying senses of the ultimate foe.

"The time has come, Christopher, for the last treatment I am able to give you," Mentor announced without preamble, as soon as Kit had checked his orbit.

"Oh—so soon? I thought you were pulling me in to pin my ears back for fighting with Kay—the dim-wit!"

"That, while a minor matter, is worthy of passing mention, since it is illustrative of the difficulties inherent in the project of developing, without over-controlling, such minds as yours. En route here, you made a masterly summation of the situation, with one outstanding omission."

"Huh? What omission? I covered it like a blanket!"

"You assumed throughout, and still assume, as you always do in dealing with your sisters, that you are unassailably right; that your

conclusion is the only tenable one; that they are always wrong."

"But they *are!* That's why you sent Kay to Lyrane!"

"In these conflicts with your sisters, you have been right in approximately half of the cases," Mentor informed him.

"But how about their fights with each other?"

"Do you know of any such?"

"Why . . . uh . . . can't say that I do." Kit's surprise was plain. "But since they fight with me so much, they must—"

"That does not follow, and for a very good reason. We may as well discuss that reason now, as it is a necessary part of the education which you are about to receive. You already know that your sisters are very different, each from the other. Know now, that each was specifically developed to be so completely different that there is no possible point which could be made an issue between any two of them."

It took some time for Kit to digest that news. "Then where do I come in that they *all* fight with me at the drop of a hat?"

"That, too, while regrettable, is inevitable. Each of your sisters, as you may have suspected, is to play a tremendous part in that which is to come. The Lensmen, we of Arisia, all will contribute, but upon you Children of the Lens—especially upon the girls—will fall the greater share of the load. Your individual task will be that of co-ordinating the whole; a duty which no Arisian is or ever can be qualified to perform. You will have to direct the efforts of your sisters; reinforcing every heavily-attacked point with your own incomparable force and drive; keeping them smoothly in mesh and in place. As a side issue, you will also have to co-ordinate the feebler efforts of us of Arisia, the Lensmen, the Patrol, and whatever other minor forces we may be able to employ."

"Holy . . . Klono's . . . claws!" Kit was gasping like a fish. "Just where, Mentor, do you figure I'm going to pick up the jets to swing *that* load? And as to co-ordinating the kids—that's out. I'd make just one suggestion to any one of them and she'd forget all about the battle and tear into me . . . no, I'll take that back. The stickier the going, the closer they rally 'round."

"Right. It will always be so. Now, youth, that you have these facts, explain these matters to me, as a sort of preliminary exercise."

"I think I see." Kit thought intensely. "The kids don't fight with each other because they don't overlap. They fight with me because my central field overlaps them all. They have no occasion to fight with anybody else, nor have I, because with anybody else our viewpoint is always right and the other fellow knows it—except for Palainians and such, who think along different lines than we do. Thus, Kay never fights with Nadreck. When he goes off the beam, she simply ignores him and goes on about her business. But with them and me—we'll have to learn to arbitrate, or something, I suppose—" his thought trailed off.

"Manifestations of adolescence;

with adulthood, now coming fast, they will pass. Let us get on with the work."

"But wait a minute!" Kit protested. "About this co-ordinator thing. I can't do it. I'm too much of a kid. I won't be ready for a job like that for a thousand years!"

"You must be ready," Mentor's thought was inexorable. "And, when the time comes, you shall be. Now, come fully into my mind."

There is no use in repeating in detail the progress of an Arisian supereducation, especially since the most accurate possible description of the most important of those details would be intrinsically meaningless. When, after a few weeks of it, Kit was ready to leave Arisia, he looked much older and more mature than before; he felt immensely older than he looked. The concluding conversation of that visit, however, is worth recording.

"You now know, Kinnison," Mentor mused, "what you children are and how you came to be. You are the accomplishment of long lifetimes of work. It is with most profound satisfaction that I now perceive clearly that those lifetimes have not been spent in vain."

"Yours, you mean." Kit was embarrassed, but one point still bothered him. "Dad met and married mother, yes, but how about the others? Tregonsee, Worsel, and Nadreck? They and the corresponding females were also penultimates, of lines as long as ours. Your Council decided that the human stock was best, so none of the other Second-Stage Lensmen ever met their female complements. Not that it could make any difference to them, of course, but I should think that three of your fellow students wouldn't feel so good."

"I am very glad indeed that you mention the point." The Arisian's thought was positively gleeful. "You have at no time, then, detected anything peculiar about this that you know as Mentor of Arisia?"

"Why, of course not. How could I? Or, rather, why should I?"

"Any lapse on our part, however slight, from practically perfect synchronization would have revealed to such a mentality as yours that I, whom you know as Mentor, am not an individual, but four. While we each worked as individuals upon all of the experimental lines, whenever we dealt with any one of the penultimates or ultimates we did so as a fusion. This was necessary, not only for your fullest possible development, but also to be sure that each of us had complete data upon every minute facet of the truth. While it was in no sense important to the work itself to keep you in ignorance of Mentor's plurality, the fact that we could keep you ignorant of it, particularly now that you have become adult, showed that our work was being done in a really workmanlike fashion."

Kit whistled: a long, low whistle which was tribute enough to those who knew what it meant. He knew what he meant, but there were not enough words or thoughts to express it.

"But you're going to keep on be-

ing Mentor, aren't you?" he asked.

"I am. The real task, as you know, lies ahead."

"QX. You say that I'm adult. I'm not. You imply that I'm more than several notches above you in qualifications. I could laugh myself silly about that one, if it wasn't so serious. Why, any one of you Arisians has forgotten more than I know, and could tie me up into bowknots!"

"There are elements of truth in your thought. That you can now be called adult, however, does not mean that you have attained your full power; only that you are able to use effectively the powers you have and are able to acquire other and larger powers."

"But what *are* those powers?" Kit demanded. "You've hinted on that same theme a thousand times, and I don't know what you mean any better than I did before!"

"You must develop your own powers." Mentor's thought was as final as fate. "Your mind is potentially far abler than mine. You will in time come to know my mind in full; I never will be able to know yours. For the lesser, but full mind to attempt to instruct in methodology the greater, although emptier one, is to set that greater mind in an under-sized mold and thus to do it irreparable harm. You have the abilities and the powers. You will have to develop them yourself, by the perfection of techniques concerning which I can give you no instructions whatever."

"But surely you can give me some kind of a hint!" Kit pleaded. "I'm just a kid, I tell you—I don't even know how or where to begin!"

Under Kit's startled mental gaze, Mentor split suddenly into four parts, laced together by a pattern of thoughts so intricate and so rapid as to be unrecognizable. The parts fused and again Mentor spoke.

"I can point the way in only the broadest, most general terms. It has been decided, however, that I can give you one hint—or, more properly, one illustration. The surest test of knowledge known to us is the visualization of the Cosmic All. All science is, as you know, one The true key to power lies in the knowledge of the underlying reasons for the succession of events. If it is pure causation—that is, if any given state of things follows as an inevitable consequence because of the state existing an infinitesimal instant before—then the entire course of the macrocosmic universe was set for the duration of all eternity in the instant of its coming into being. This well-known concept, the stumbling block upon which many early thinkers came to grief, we now know to be false. On the other hand, if pure randomness were to govern, natural laws as we know them could not exist. Thus neither pure causation nor pure randomness alone can govern the succession of events.

"The truth, then, must lie somewhere in between. In the macrocosmos, causation prevails; in the micro-, randomness; both in accord with the mathematical laws of probability. It is in the region between them—the intermediate zone,

or the interface, so to speak—that the greatest problems lie. The test of validity of any theory, as you know, is the accuracy of the predictions which are made possible by its use, and our greatest thinkers have shown that the completeness and fidelity of any visualization of the Cosmic All are linear functions of the clarity of definition of the components of that interface. Full knowledge of that indeterminate zone would mean infinite power and a statistically perfect visualization. None of these things, however, will ever be realized; for the acquirement of that full knowledge would require infinite time.

"That is all I can tell you. It will, properly studied, be enough. I have built within you a solid foundation; yours alone is the task of erecting upon that foundation a structure strong enough to withstand the forces which will be thrown against it.

"It is perhaps natural, in view of what you have recently gone through, that you should regard the problem of the Eddorians as one of insuperable difficulty. Actually, however, it is not, as you will perceive when you have spent a few weeks in re-integrating yourself. You must not, you shall not, and in my clear visualization you do not, fail."

Communication ceased. Kit made his way groggily to his control board, went free, and lined out for Klovia. For a guy whose education was supposed to be complete, he felt remarkably like a total loss with no insurance. He had asked for advice and had got—what? A dissertation on philosophy, mathematics, and physics—good enough stuff, probably, if he could see what Mentor was driving at, but not of much immediate use. He did have a brainful of new stuff, though—didn't know yet what half of it was—he'd better be getting it licked into shape. He'd "sleep" on it.

He did so, and as he lay quiescent in his bunk the tiny pieces of an incredibly complex jig saw puzzle began to click into place. The ordinary zwilniks—all the small fry fitted in well enough. The Overlords of Delgon. The Kalonians . . . hm-m-m . . . he'd better check with Dad on that angle. The Eich—under control. Kandron of Onlo, ditto. "X" was in safe hands: Cam had already been alerted to watch her step. Some planet named Ploor—what in all the purple hells of Palain had Mentor meant by that crack? Anyway, that piece didn't fit anywhere—yet. That left Eddore—and at the thought a series of cold waves raced up and down the young Lensman's spine. Nevertheless, Eddore was his oyster—his, and nobody else's. Mentor had made that plain enough. Everything the Arisians had done for umpteen million years had been aimed at the Eddorians. They had picked him out to emcee the show—and how could a man co-ordinate an attack against something about which he knew nothing? And the only way to get acquainted with Eddore and its denizens was to go there. Should he call in the kids?

He should not. Each of them had her hands full of her own job; that of developing her full self. He had his; and the more he studied the question, the clearer it became that the first number on the program of his self-development was—would *have* to be—a single-handed expedition against the key planet of Civilization's top-ranking foes.

He sprang out of his bunk, changed his vessel's course, and lined out a thought to his father.

"Dad? Kit. Been flitting around out Arisia way, and picked up an idea that I want to pass along to you. It's about Kalonians. What do you know about them?"

"They're blue—"

"I don't mean that."

"I know you don't. There were Helmuth, Jalte, Prellin, Crowninshield . . . all I can think of at the moment. Big operators, son, and smart hombres, if I do say so myself as shouldn't; but they're all ancient history . . . hold it! Maybe I know of a modern one, too—Eddie's Lensman. The only part of that picture that was sharp was the Lens, since Eddie was never analytically interested in any of the hundreds of types of people he met, but there was something about that Lensman . . . I'll bring him back and focus him as sharply as I can—there." Both men studied the blurred statue posed in the Gray Lensman's mind. "Wouldn't you say he could be a Kalonian?"

"Check. I wouldn't want to say much more than that. But about that Lens—did you really examine it? It *is* sharp—under the circumstances, of course, it would be."

"Certainly! Wrong in every respect—rhythm, chroma, context, and aura. Definitely not Arisian; therefore Boskonian. That's the point—that's what I was afraid of, you know."

"Double check. And that point ties in absolutely tight with the one that made me call you just now, that everybody, including you and me, seems to have missed. I've been searching my memory for five hours—you know what my memory is like—and I have heard of exactly two other Kalonians. They were big operators, too. I have never heard of the planet itself. To me it is a startling fact that the sum total of my information on Kalonia, reliable or otherwise, is that it produced seven big-shot zwilniks; six of them before I was born. Period."

Kit felt his father's jaw drop.

"No, I don't believe that I have ever heard anything about the planet, either," the older man finally replied. "But I'll bet that I can get you all the information you want in fifteen minutes."

"Credits to millos it'll be a lot nearer fifteen days. You can find it sometime, though, if anybody can—that's why I'm taking it up with you. While I don't want to seem to be giving a Gray Lensman orders"—that jocular introduction had come to be a sort of ritual in the Kinnison family—"I would very diffidently suggest that there might be some connection between that completely unnoticed planet and

some of the things we don't know about Boskonia."

"Diffident! You?" The Gray Lensman laughed deeply. "Like an atomic bomb! I'll start a search on Kalonia right away. As to your credits-to-millos-fifteen-days thing, I'd be ashamed to take your money. You don't know our librarians or our system. Ten millos, even money, that we get full data in less than five G-P days from right now. Want it?"

"I'll say so. I'll wear that cento on my tunic as a medal of victory over the Gray Lensman. I *do* know the size of these here two galaxies!"

"QX—it's a bet. I'll let you know if we find anything. In the meantime, Kit, remember that you're my favorite son."

"Well, you're not so bad, yourself. 'Any time I want mother to divorce you so as to change fathers for me I'll let you know." What a terrific, what a tremendous meaning was heterodyned upon that seemingly light exchange! "Clear ether, Dad!

"Clear ether, son!"

XIII.

Thousands of years were to pass before Christopher Kinnison could develop the ability to visualize, from the contemplation of one fact or artifact, the entire Universe to which it belonged. He could not even plan in detail his one-man invasion of Eddore until he could integrate all available data concerning the planet Kalonia into his visualization of the Boskonian Empire. One unknown, Ploor, blurred his picture badly enough; two such completely unknown factors made visualization, even in broad, impossible.

Anyway, he decided, he had one more job to do before he tackled the key planet of the enemy; and now, while he was waiting for the dope on Kalonia, would be the best time to do it. Wherefore he sent out a thought to his mother.

"Hi, First Lady of the Universe! 'Tis thy first-born who wouldst fain converse with thee. Art pressly engaged in matters of moment or import?"

"Art not, Kit." Clarrissa's characteristic chuckle was as infectious, as full of the joy of life, as ever. "Not that it would make any difference—but methinks I detect an undertone of seriosity beneath thy persiflage. Spill it."

"Let's make it a rendezvous, instead," he suggested. "We're fairly close, I think—closer than we've been for a long time. Where are you, exactly?"

"Oh! Can we? Wonderful!" She marked her location and velocity in his mind. She made no effort to conceal her joy at the idea of a personal meeting. She never had tried and she never would try to make him put first matters other than first. She had not expected to see him again, physically, until this war was over. But if she could—!

"QX. Hold your course and speed; I'll be seeing you in eighty-three minutes. In the meantime,

it'll be just as well if we don't communicate, even by Lens."

"Why, son?"

"Nothing definite—just a hunch, is all. 'Bye, Gorgeous!"

The two speedsters approached each other—inerted—matched intrinsics—went free—flashed into contact—sped away together upon Clarrissa's original course.

"Hi, Mums!" Kit spoke into a visiphone, "I should, of course, come to you, but it might be better if you come in here—I've got some special rigs set up here that I don't want to leave. QX?" He snapped on one of the special rigs as he spoke—a device which he himself had built and installed: the generator of a screen which would detect upon every possible band and channel of thought or of intrusion.

"Why, of course!" She came, and was swept off her feet in the exuberance of her tall son's embrace; a greeting which she returned with a fervor at least the equal of his own.

"It's nice, Mother, seeing you again." Words, or thoughts even, were *so* inadequate! Kit's voice was a trifle rough: his eyes were not completely dry.

"Uh-huh. It *is* nice," she agreed, snuggling her spectacular head even more firmly into the curve of his shoulder. "Mental contact is better than nothing, of course, but *this* is perfect!"

"Just as much a menace to navigation as ever, aren't you?" He held her at arm's length and shook his head in mock disapproval. "Do you think it's quite right for one woman to have so much of everything when all the others have so little of anything?"

"Honestly, I don't." She and Kit had always been exceptionally close; now her love for and her pride in this splendid creature, her son and her first-born, simply would not be denied. "You're joking, I know, but that strikes too deep for comfort. I wake up in the night to wonder why, of all the women in existence, I should be so lucky, especially in my children. QX, skip it." Kit was shying away—she should have known better than to try in words even to skirt the profound depths of sentiment which both she and he knew so well were there.

"Get back onto the beam, Gorgeous, you know what I meant. Look at yourself in a mirror some day—or do you, perchance?"

"Once in a while—maybe twice." She giggled unaffectedly. "You don't think that all this charm and glamour comes without effort, do you? But maybe you'd better get back on the beam yourself—I know that you didn't come all these parsecs out of your way to say pretty things to your mother—even though I admit that they've built up my ego no end."

"On target, dead center." Kit had been grinning, but he sobered quickly. "I wanted to talk to you about Lyrane and the job you're figuring on doing out there."

"Why?" she demanded. "Do you know anything about it?"

"Unfortunately, I don't." Kit's black frown of concentration re-

minded her forcibly of his father's characteristic scowl. "Guesses—suspicions—theories—not even good hunches. But I thought . . . I wondered—" He paused, embarrassed as a schoolboy, then went on with a rush: "Would you mind it too much if I went into something pretty personal?"

"You know I wouldn't, son." In contrast to Kit's usual clarity and precision of thought, the question was highly ambiguous, but Clarrissa covered both angles. "I can conceive of no subject, event, action, or thing, in either my life or yours, too intimate or too personal to discuss with you in full. Can you?"

"No, I can't—but this is different. As a woman, you're tops—the finest and best that ever lived." This statement, made with all the matter-of-factness of stating that a triangle had three corners, thrilled Clarrissa through and through. "As a Gray Lensman you're over the rest of them like a cirrus cloud. But you should rate full Second Stage, and . . . well, you may run up against something too hot to handle, some day, and I . . . that is, you—"

"You mean that I don't measure up?" she asked, quietly. "I know very well that I don't, and admitting an evident fact should not hurt my feelings a bit. Don't interrupt, please," as Kit began to protest. "In fact, it is sheerest effrontery—it has always bothered me terribly, Kit—to be classed as a Lensman at all, considering what splendid men they all are and what each one of them had to go through to earn his Lens. You know as well as I do that I have never done a single thing to earn or to deserve it. It was handed to me on a silver platter. I'm not worthy of it, Kit, and all the real Lensmen know that I'm not. They *must* know it, Kit—they *must* feel that way!"

"Did you ever express yourself in exactly that way before, to anybody? You didn't, I know." Kit stopped sweating; this was going to be easier than he had feared.

"I couldn't, Kit, it was too deep; but as I said, I can talk *anything* over with you."

"QX. We can settle that fast enough if you will answer just one question. Do you honestly believe that you would have been given the Lens if you were not absolutely worthy of it? Perfectly—in every minute particular?"

"Why, I never thought of it that way . . . probably not . . . no, certainly not." Clarrissa's somber mien lightened markedly. "But I still don't see how or why—"

"Clear enough," Kit interrupted. "You were born with what the rest of them had to work so hard for—with stuff that no other woman, anywhere, ever had."

"Except the girls, of course," Clarrissa corrected, half-absently.

"Except the kids," he concurred. It could do no harm to agree with his mother's statement of a self-evident fact.

He crossed the room and adjusted a couple of dials. His vessel's screens would not now react to the thoughts of Mentor of Arisia, but would still announce the presence

of any possible other. "You can take it from me, as one who *knows*, that the other Lensmen know that you've got plenty of jets. They all know also that the Arisians never did and never will make a Lens for anybody who hasn't got what it takes. And so, very neatly, we have stripped ship for the action I came over here to see you about. It isn't a case of you not measuring up, because you do, in every respect. It's simply that you're short a few jets that you ought by rights to have. You really are a Second-Stage Lensman—you know that, Mums—but you never went to Arisia for your real L2 work. I hate to see you blast off without full equipment into what may prove to be a big-time job; especially when you're so eminently able to take it. Mentor could give you the works in a couple of hours. Why don't you flit for Arisia right now, or let me take you there?"

"No—NO!" Clarrissa backed away, shaking her head emphatically. "Never! I couldn't, Kit, ever —not *possibly!*"

"Why not?" Kit was amazed. "Why, Mother, you're actually shaking!"

"I know I am—I can't help it. That's why. He's the only thing in the entire Universe that I'm really afraid of. I can talk *about* him without quite getting goose-bumps all over me, but the mere thought of actually being with him simply scares me into shivering, quivering fits."

"I see . . . it might very well work that way, at that. Does Dad know it?"

"Yes . . . or, that is, he knows that I'm afraid of Mentor, but he doesn't know it the way you do . . . it simply doesn't register in true color. Kim can't even conceive of me being either a coward or a cry-baby. And I don't want him to, either, Kit, so please don't tell him, ever."

"I won't—he'd fry me to a cinder in my own grease if I did. Frankly, I can't see any part of your self-portrait, either. As a matter of

was real. Instrument-and recorder-tapes could be and were being doctored to fit; but spent primary shells could not be simulated. Nor was it thinkable that this tremendous ship and its incipient Base should be allowed to survive.

Hence, after the dreadful primaries had quieted the Eich's main batteries and had reduced the groundworks to flaming pools of lava, needle-beamers went to work on every minor and secondary control board. Then, the great vessel

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definitely helpless as a fighting unit, Worsel and his hard-bitten crew thought that they went—thought-screened, full-armored, armed with semiportables and DeLameters—joyously into the hand-to-hand combat which each so craved. Worsel and two of his strongest henchmen attacked the armed and armored Boskonian captain. After a satisfying terrific struggle, in the course of which all three of the Velantians—and some others—were appropriately burned and wounded, they overpowered him and carried him bodily into the control room of the *Velan*. This part of the episode, too, was real; as was the complete melting down of the Boskonian vessel which occurred while the transfer was being made.

Then, while Con was engaged in the exceedingly delicate task of withdrawing her mind from Worsel's without leaving any detectable trace that she had ever been in it, there happened the completely unexpected; the one thing for which she was utterly unprepared. The mind of the captive captain was wrenched from her control as palpably as a loosely-held stick is snatched from a physical hand; and at the same time there was hurled against her impenetrable barriers an attack which could not possibly have stemmed from any Eichian mind!

If her mind had been free, she could have coped with the situation, but it was not. She *had* to hold Worsel—she knew with cold certainty what would ensue if she did

not. The crew? They could be blocked out temporarily—unlike the Velantian Lensman, no one of them could even suspect that he had been in a stasis unless it were long enough to be noticeable upon such timepieces as clocks. The procedure, however, occupied a millisecond or so of precious time; and a considerably longer interval was required to withdraw with the required tracelessness from Worsel's mind. Thus, before she could do anything except protect herself and the Velantian from that surprisingly powerful invading intelligence, all trace of it disappeared and all that remained of their captive was a dead body.

Worsel and Constance stared at each other, wordless, for seconds. The Velantian had a completely and accurately detailed memory of everything that had happened up to that instant, the only matter not quite clear being the fact that their hard-won captive was dead; the girl's mind was racing to fabricate a bulletproof explanation of that startling fact. Worsel saved her the trouble.

"It is, of course, true," he thought at her finally, "that any mind of sufficient power can destroy by force of will alone the entity of flesh in which it resides. I never thought about this matter before in connection with the Eich, but no detail of the experience your father and I had with them on Jarnevon would support any contention that they do not have minds of the requisite power, and today's battle, being purely physical, would not throw any light on the subject. I wonder if a thing like that could be stopped? That is, if we had been on time—?"

"That's it, I think." Con put on her most disarming, most engaging grin in preparation for the most outrageous series of lies of her long career. "And I don't think it can be stopped—at least I couldn't stop him. You see, I got into him a fraction of a second before you did, and in that instant, just like that," in spite of the fact that Worsel could not hear, she snapped her finger ringingly, "Faster even than that, he was gone. I didn't think of it until you brought it up, but you are as right as can be—he killed himself to keep us from finding out whatever it was that he knew about what is left of Boskonia."

Worsel stared at her with six eyes now instead of one, gimlet probes which glanced imperceptibly off her shield. He was not consciously trying to break down her barriers—to his fullest perception they were already down; no barriers were there. He was not consciously trying to integrate or reintegrate any detail or phase of the episode just past—no ioto or trace of falsity had appeared at any point or instant. Nevertheless, deep down within those extra reaches that made Worsel of Velantia what he was, a vague disquiet refused to down. It was too . . . too—Worsel's consciousness could not supply the adjective.

Had it been too easy? Very decidedly it had not. His utterly wornout, battered and wounded

crew refuted that thought. So did his own body, slashed and burned, as well as did the litter of primary shells and the heaps of smoking slag which had once been an enemy stronghold.

Also, even though he had not theretofore thought that he and his crew possessed enough force to do what had just been done, it was starkly unthinkable that anyone, even an Arisian, could have helped him do anything without his knowledge. Particularly how could this girl, daughter of Kimball Kinnison although she was, possibly have stuff enough to play unperceived the part of guardian angel to him, Worsel of Velantia?

Least able of all the Second-Stage Lensmen to appreciate what the Children of the Lens really were, he did not, then or ever, have any inkling of the real truth. But Constance, far behind her cheerfully innocent mask, shivered as she read exactly his disturbed and disturbing thoughts. For, conversely, an unresolved enigma would affect him more than it would any of his fellow L2's. He would work on it until he did resolve it, one way or another. This thing had to be settled, *now*. And there was a way—a good way.

"But I *did* help you, you big lug!" she stormed, stamping her booted foot in emphasis. "I was in there every second, slugging away with everything I had. Didn't you even feel me, you dope?" She allowed a thought to become evident; widened her eyes in startled incredulity. "You *didn't!*" she accused, hotly. "You were reveling so repulsively in the thrill of body-to-body fighting, just like you were back there in that cavern of Overlords, that you couldn't have felt a thought if it was driven into you with a D2P pressor! And I'll bet credits to millos that I *did* help you, too—that if I hadn't been in there pitching, dulling their edges here and there at critical moments, you'd've had a time getting them at all! I'm going to flit right now, and I hope I *never* see you again as long as I live!"

This vicious counterattack, completely mendacious though it was, fitted the facts so exactly that Worsel's inchoate doubts vanished. Moreover, he was even less well equipped than are human men to cope with the peculiarly feminine weapons Constance was using so effectively. Wherefore the Velantian capitulated, almost abjectly, and the girl allowed herself to be coaxed down from her high horse and to become her usual sunny and impish self.

But when the *Velan* was once more on course and she had retired to her cabin, it was not to sleep. Instead, she thought. Was this intellect of the same race as the one whose burst of thought she had caught such a short time before, or not? She could not decide—not enough data. The first thought had been unconscious and quite revealing; this one simply a lethal weapon, driven with a power the very memory of which made her gasp again. They could, however, be

the same—the mind with which she had been *en rapport* could very well be capable of generating the force she had felt. If they were the same, they were something that should be studied, intensively and at once; and she herself had kicked away her only chance to make that study. She had better tell somebody about this, even if it meant confessing her own bird-brained part, and get some competent advice. Who?

Kit? No. Not because he would smack her down—she *ought* to be smacked down!—but because his brain wasn't enough better than her own to do any good. In fact, it wasn't a bit better than hers.

Mentor? At the very thought she shuddered, mentally and physically. She would call him in, fast enough, regardless of consequences to herself, if it would do any good, but it wouldn't. She was starkly certain of that. He wouldn't smack her down, like Kit would, but he wouldn't help her, either. He'd just sit there and sneer at her while she stewed, hotter and hotter, in her own juice.

"In a childish, perverted, and grossly exaggerated way, Daughter Constance, you are right," the Arisian's thought rolled sonorously into her astounded mind. "You got yourself into this—get yourself out. One promising fact, however, I perceive—although seldom and late—you at last begin really to think."

In that hour Constance Kinnison grew up.

XI.

Any human or near-human Lensman would have been appalled by the sheer loneliness of Nadreck's long vigil. Almost anyone of them would have cursed, fluently and bitterly, when the time came at which he was forced to concede that the being for whom he lay in wait was not going to visit that particular planet.

But utterly unhuman Nadreck was not lonely. In fact, there was no word in the vocabulary of his race even remotely resembling the term in definition, connotation, or implication. From his Galaxy-wide study he had a dim, imperfect idea of what such an emotion or feeling might be, but he could not begin to understand it. Nor was he in the least disturbed by the fact that Kandron did not appear. Instead, he held his orbit until the minute arrived at which the mathematical probability became point nine nine eight that his proposed quarry was not going to appear. Then, as matter-of-factly as though he had merely taken half an hour out for lunch, he abandoned his position and set out upon the course so carefully planned for exactly this event.

The search for further clues was long and uneventful; but monstrously, unhumanly patient Nadreck stuck to it until he found one. True, it was so slight as to be practically nonexistent—a mere fragment of a whisper of zwilnik instruction—but it bore Kandron's unmistakable imprint. The Palainian had expected no more. Kan-

dron would not slip. Momentary leakages from faulty machines would have to occur from time to time, but Kandron's machines would not be at fault either often or long at a time.

Nadreck, however, had been ready. Course after course of the most delicate spotting screen ever devised had been out for weeks. So had tracers, radiation absorbers, and every other insidious locating device known to the science of the age. The standard dectors remained blank, of course—no more so than his own conveyance would that of the Onlonian be detectable by any ordinary instruments. And as the Palainian speedster shot away along the most probable course, some fifty delicate instruments in its bow began stabbing that entire region of space with a pattern of needles of force through which a Terrestrial barrel could not have floated untouched.

Thus the Boskonian craft—an inherently indetectable speedster—was located; and in that instant was speared by three modified CRX tracers. Nadreck then went inert and began to plot the other speedster's course. He soon learned that that course was unpredictable; that the vessel was being operated statistically, completely at random. This too, then, was a trap.

This knowledge disturbed Nadreck no more than had any more-or-less-similar event of the previous twenty-odd years. He had realized fully that the leakage could as well have been deliberate as accidental. He had at no time underestimated Kandron's ability; the future alone would reveal whether or not Kandron would at any time underestimate his. He would follow through—there might be a way in which this particular trap could be used against its setter.

Leg after leg of meaningless course Nadreck followed, until there came about that which the Palainian knew would happen in time—the speedster held a straight course for more parsecs than six-sigma limits of probability could ascribe to pure randomness. Nadreck knew what that meant. The speedster was returning to its base for servicing, which was precisely the event for which he had been waiting. It was the base he wanted, not the speedster; and that base would never, under any conceivable conditions, emit any detectable quantity of traceable radiation. To its base, then, Nadreck followed the little spaceship, and to say that he was on the alert as he approached that base is a gross understatement indeed. He expected to set off at least one, and probably many blasts of force. That would almost certainly be necessary in order to secure sufficient information concerning the enemy's defensive screens. It was necessary—but when those blasts arrived Nadreck was elsewhere, calmly analyzing the data secured by his instruments during the brief contact which had triggered the Boskonian projectors into action.

So light, so fleeting, and so unorthodox had been Nadreck's

touch that the personnel of the now doomed base could not have known with any certainty that any visitor had actually been there. If there had been, the logical supposition would have been that he and his vessel had been resolved into their component atoms. Nevertheless Nadreck waited—as has been shown, he was good at waiting—until the burst of extra vigilance set up by the occurrence would have subsided into ordinary watchfulness. Then he began to act.

At first this action was in ultra-slow motion. One millimeter per hour his drill advanced. Drill was synchronized precisely with screen, and so guarded as to give an alarm at a level of interference far below that necessary to energize any probable detector at the generators of the screen being attacked.

Through defense after defense Nadreck made his cautious, indetectable way into the dome. It was a small base, as such things go; manned, as expected, by escapees from Onlo. Scum, too, for the most part; creatures of even baser and more violent passions than those upon whom he had worked in Kandron's Onlonian stronghold. To keep those intractable entities in line during their brutally long tours of duty, a psychological therapist had been given authority second only to that of the Base Commander. That knowledge, and the fact that there was only one populated dome, made the Palainian come as close to grinning as one of his unsmiling race can.

The psychologist wore a multiplex thought-screen, of course, as did everyone else; but that did not bother Nadreck. Kinnison had opened such screens many times; not only by means of his own hands, but also at various times by the use of a dog's jaws, a spider's legs and mandibles, and even a worm's sinuous body. Wherefore, through the agency of a quasi-fourth-dimensional life form literally indescribable to three-dimensional man, Nadreck's ego was soon comfortably ensconced in the mind of the Onlonian.

That entity knew in detail every weakness of each of his personnel. It was his duty to watch those weaknesses, to keep them down, to condition each of his wards in such fashion that friction and strife would be minimized. Now, however, he proceeded to do exactly the opposite. One hated another. That hate became a searing obsession, requiring the concentration of every effort upon ways and means of destroying its object. One feared another. That fear ate in, searing as it went, destroying every normality of outlook and of reason. Many were jealous of their superiors. This emotion, requiring as it does nothing except its own substance upon which to feed, became a fantastically-spreading, caustically corrosive blight.

To name each ugly, noisome passion or trait resident in that dome is to call the complete roster of the vile; and calmly, mercilessly, unmovedly, ultra-efficiently, Nadreck worked upon them all. As though he were playing a Sanatic organ

he touched a nerve here, a synapse there, a channel somewhere else, bringing the whole group, with the lone exception of the commander, simultaneously to the point of explosion. Nor was any sign of this perfect work evident externally; for everyone there, having lived so long under the iron code of Boskonia, knew exactly the consequences of any infraction of that code.

The moment came when passion overmastered sense. One of the monsters stumbled, jostling another. That nudge became, in its recipient's seething mind, a lethal attack by his bitterest enemy. A forbidden projector flamed viciously—the offended one was sating his lust so insensately that he scarcely noticed the bolt that in turn rived away his own life. Detonated by this incident, the personnel of the Base exploded as one. Blasters raved briefly; knives and swords bit and slashed; improvised bludgeons crashed against pre-selected targets; hard-taloned appendages gouged and tore. And Nadreck, who had long since withdrawn from the mind of the psychologist, timed with a stop watch the duration of the whole grizzly affair, from the instant of the first stumble to the death of the last Onlonian outside the Commander's locked and armored sanctum. Ninety-eight and three tenths seconds. Good—a nice job.

The Base Commander, as soon as it was safe to do so, rushed out of his guarded room to investigate. Amazed, disgruntled, dismayed by the to him completely inexplicable phenomenon he had just witnessed, he fell an easy prey to the Palainian Lensman. Nadreck invaded his mind and explored it, channel by channel; finding—not entirely unexpectedly—that this Number One knew nothing whatever of interest.

Nadreck did not destroy the base. Instead, after setting up a small instrument in the Commander's office, he took that unfortunate wight aboard his speedster and drove off into space. He immobilized his captive, not by loading him with manacles, but by deftly severing a few essential nerve trunks. Then he really studied the Onlonian's mind—line by line, this time: almost cell by cell. A master—almost certainly Kandron himself—had operated here. There was not the slightest trace of tampering; no leads to or indications of what the activating stimulus would have to be; all that the fellow now knew was that it was his job to hold his Base inviolate against any and every form of intrusion and to keep that speedster flitting around all over space on a director-by-chance as much as possible of the time, leaking slightly a certain signal now and then.

Even under this microscopic reexamination, he knew nothing whatever of Kandron; nothing of Onlo or of Thrale; nothing of any Boskonian organization, activity, or thing; and Nadreck, although baffled still, remained undisturbed. This trap, he thought, could almost certainly be used against the trapper. Until a certain call came through

his relay in the Base, he would investigate the planets of this system.

During the investigation a thought impinged upon his Lens from Karen Kinnison, one of the very few warm-blooded beings for whom he had any real liking or respect.

"Busy, Nadreck?" she asked, as casually as though she had seen him hours, instead of weeks before.

"In large, yes—in detail and at the moment, no. Is there any small problem in which I can be of assistance?"

"Not small—big. I just got the funniest distress call I ever heard or heard of. On a high band—way, 'way up—there. Do you know of any race that thinks on that band?"

"I do not believe so." He thought for a moment. "Definitely, no."

"Neither do I. It wasn't broadcast, either, but was directed at any member of a special race or tribe—very special. Classification, straight Z's to ten or twelve places, she . . . or it . . . seemed to be trying to specify."

"A frigid race of extreme type, adapted to an environment having a temperature of only a few degrees absolute."

"Yes. Like you, only more so." Kay paused, trying to put into intelligible thought a picture inherently incapable of reception or recognition by her as yet strictly three-dimensional intelligence. "Something like the Eich, too, but not much. Their visible aspect was obscure, fluid . . . amorphous . . . indefinite? . . . skip it—I couldn't really perceive it, let alone describe it. I wish you had caught that thought."

"I wish so, too—it is extremely interesting. But tell me—if the thought was directed, not broadcast, how could you have received it?"

"That's the funniest part of the whole thing." Nadreck could feel the girl frown in concentration. "It came at me from all sides at once—never felt anything like it. Naturally I started feeling around for the source—particularly since it was a distress signal—but before I could get even a general direction of the origin it . . . it . . . well, it didn't really disappear or really weaken, but *something* happened to it. I couldn't read it any more—and *that* really did throw me for a loss." She paused, then went on. "It didn't so much go away as go *down*, some way or other. Then it vanished completely, without really going anywhere. I know that I'm not making myself clear—I simply can't—but have I given you enough leads so that you can make any sense at all out of any part of it?"

"I'm very sorry to say that I can not."

Nor could he, ever, for excellent reasons. That girl had a mind whose power, scope, depth, and range she herself did not, could not even dimly understand; a mind to be fully comprehended only by an adult of her own third level. That mind had in fact received in toto a purely fourth-dimensional thought. If Nadreck had received it, he would

have understood it and recognized it for what it was only because of his advanced Arisian training—no other Palainian could have done so—and it would have been sheerly unthinkable to him that any warm-blooded and, therefore, strictly three-dimensional entity could by any possibility receive such a thought; or, having received it, could understand any figment of it. Nevertheless, if he had really concentrated the full powers of his mind upon the girl's attempted description, he might very well have recognized in it the clearest possible three-dimensional delineation of such a thought; and from that point he could have gone on to a full understanding of the Children of the Lens.

However, he did not so concentrate. It was constitutionally impossible for him to devote real mental effort to any matter not immediately pertaining to the particular task in hand. Therefore neither he nor Karen Kinnison were to know until much later that she had been *en rapport* with one of Civilization's bitterest, most implacable foes; that she had seen with clairvoyant and telepathic accuracy the intrinsically three-dimensionally-indescribable form assumed in their winter by the horrid, the monstrous inhabitants of that viciously hostile world, the unspeakable planet Ploor!

"I was afraid you couldn't." Kay's thought came clear. "That makes it all the more important—important enough for you to drop whatever it is that you're doing now and join me in getting to the bottom of it, if you could be made to see it, which, of course, you can't."

"I am about to take Kandron, and nothing in the Universe can be as important as that," Nadreck stated quietly, as a simple matter of fact. "You have observed this that lies here?"

"Yes." Karen, *en rapport* with Nadreck, was, of course, cognizant of the captive, but it had not occurred to her to mention the monster. When dealing with Nadreck she, against all the tenets of her sex, exhibited as little curiosity as did the coldly emotionless Lensman himself. "Since you bid so obviously for the question, why are you keeping it alive—or rather, not dead?"

"Because he is my sure link to Kandron." If Nadreck of Palain ever was known to gloat, it was then. "He is Kandron's creature, placed by Kandron personally as an agency of my destruction. Kandron's brain alone holds the key compulsion which will restore his memories. At some future time—perhaps a second from now, perhaps a cycle of years—Kandron will use that key to learn how his minion fares. Kandron's thought will energize my re-transmitter in the dome; the compulsion will be forwarded to this still-living brain. The brain, however, will be in my speedster, not in that undamaged fortress. You now understand why I cannot stray far from this being's base; you should see that you should join me instead of me joining you."

"No; not definite enough," Karen countered, decisively. "I can't see myself passing up a thing like this

cold fact, you are so obviously neither a coward nor a cry-baby that no refutation of that canard is either necessary or desirable. What you've really got, Mums, is a fixation, and if it can't be removed—"

"It can't," she declared flatly. "I've tried that, now and then, ever since before you were born. Whatever it is, it's a permanent installation and it's really deep. I have known all along that Kim didn't give me the whole business—he couldn't—and I've tried again and again to make myself go to Arisia, or at least to call Mentor about it, but I can't do it, Kit—I simply *can't!*"

"I understand." Kit nodded. He did understand, now. What she felt was not, in essence and at bottom, fear at all. It was worse than fear, and deeper. It was true revulsion; the basic, fundamental, subconscious, sex-based reaction of an intensely vital human female against a mental monstrosity who had not had a sexual thought for countless thousands of her years. She could neither analyze nor understand her feeling; but it was as immutable, as ineradicable, and as old as the surging tide of life itself.

"But there's another way, just as good—probably better, as far as you're concerned. You aren't afraid of me, are you?"

"What a *question!* Of course I'm not—Why, do you mean *you*—" Her expressive eyes widened. "You children—especially you—are far beyond us . . . as, of course, you should be . . . but *can* you, Kit? *Really?*"

Kit keyed a part of his mind to an ultra-high level. "I know the techniques, Mentor, but the first question is, should I do it?"

"You should. The time has come when it is necessary."

"Second—I've never done anything like this before, and she's my own mother. If I make one slip, I'll never forgive myself. Will you stand by and see that I don't slip?"

"I will stand by."

"I really can, Mums." Kit answered her question with no perceptible pause. "That is, if you are willing to put everything you've got into it. Just letting me into your mind isn't enough. You'll have to sweat blood—you'll think that you've been run through a hammer mill and spread out on a Delgonian torture screen to dry."

"No need for worry on that score, my son." All the passionate intensity of Clarrissa's being was in her vibrant voice. "If you just knew how utterly I have been longing for it—I'll work; and whatever you give me I can take."

"I'm sure of that. And, not to work under false pretenses, I'd better tell you how I know. Mentor showed me what to do and told me to do it."

"*Mentor!*"

"Mentor," Kit agreed. "He knew that it was a psychological impossibility for you to work with him, and that you could and would work with me. So he appointed me a committee of one." Clarrissa was

reacting to this news as it was inevitable that she should react; and to give her time to steady down he went on:

"Mentor also knew, and so do you and I, that even though you are afraid of him, you know what he is and what he means to Civilization. It was necessary for me to tell you this so that you would know, without any tinge of doubt, that I am not a half-baked kid setting out to do a man's job of work."

"Jet back, Kit! I may have thought a lot of different things about you at times, but 'half-baked' was never one of them. That is your own thinking, not mine."

"I wouldn't wonder." Kit grinned wryly. "My ego could stand some stiffening right now. This isn't going to be funny. You're too fine a woman, and I think too much of you, to enjoy the prospect of mauling you around so unmercifully."

"Why, Kit!" Her mood was changing fast. Her old-time, impish smile came back in force. "You aren't weakening, surely? Shall I hold your hand?"

"Uh-huh—cold feet," he admitted. "It might be a smart idea, at that, holding hands. Physical linkage. Well, I'm as ready as I ever will be, I guess—whenever you are, say so. And you'd better sit down before you fall down."

"QX, Kit—come in."

Kit came; and at the first terrific surge of his mind within hers the Red Lensman caught her breath, stiffened in every muscle, and all but screamed in agony. Kit's fingers needed their strength as her hands clutched his and closed in a veritable spasm. She had thought that she knew what to expect; but the reality was different—much different. She had suffered before. On Lyrane II, although she had never told anyone of it, she had been burned and wounded and beaten. She had borne five children. This was as though every poignant experience of her past had been rolled into one, raised to the n^{th} power, and stabbed deep into the tenderest, most sensitive centers of her entire being.

And Kit, boring in and in and in, knew exactly what to do; and, now that he had started, he proceeded unflinchingly and with exact precision to do what had to be done. He opened up her mind as she had never dreamed it possible for a mind to open. He separated the tiny, jammed compartments, each completely from every other. He showed her how to make room for this tremendous expansion and watched her do it, against the shrieking protests of every cell and fiber of her body and of her brain. He drilled new channels everywhere, establishing an inconceivably complex system of communication lines of infinite conductivity. He knew just what he was doing to her, since the same thing had been done to him so recently, but he kept on relentlessly until the job was done. Completely done.

Then, working together, they sorted and labeled and classified and catalogued. They checked and

double checked. Finally she knew, and Kit knew that she knew, every hitherto unplumbed recess of her mind and every individual cell of her brain. Every iota of every quality and characteristic, every scrap of knowledge she had ever acquired or ever would acquire, would be at her command instantaneously and effortlessly. Then, and only then, did Kit withdraw his mind from hers.

"Did you say that I was short just a *few* jets, Kit?" She got up groggily and mopped her face; upon which her few freckles stood out surprisingly dark upon a background of white. "I'm a wreck . . . I'd better go and—"

"As you were for just a sec—I'll break out a bottle of fayalin. This rates a celebration of sorts, don't you think?"

"Very much so." As she sipped the pungently aromatic red liquid her color began to come back. "No wonder I felt as though I were missing something all these years. Thanks, Kit. I really appreciate it. You're a—"

"Seal it, Mums." He picked her up and squeezed her, hard. He scarcely noticed her sweat-streaked face and disheveled hair, but she did.

"Good Heavens, Kit, I'm a perfect *hag!*" she exclaimed. "I've *got* to go and put on a new face!"

"QX. I don't feel quite so fresh, myself. What I need, though, is a good, thick steak. Join me?"

"Uh-uh. How can you even think of *eating*, at a time like this?"

"Same way you can think of war paint and feathers, I suppose. Different people, different reactions. QX, I'll be in there and see you in fifteen or twenty minutes. Flit!"

She left, and Kit heaved an almost explosive sigh of relief. Mighty good thing she hadn't asked too many questions—if she had become really curious, he would have had a horrible time keeping her away from the fact that that kind of work never had been done and never would be done outside of solid, multiply, Arisian screen. He ate, cleaned up, ran a comb through his hair, and, when his mother was ready, crossed over into her speedster.

"Whee . . . whee-yu!" Kit whistled descriptively. "*What* a seven-sector call-out! Just who do you think you're going to knock out of the ether on Lyrane II?"

"Nobody at all." Clarrissa laughed. "This is all for you, son—and maybe a little bit for me, too."

"I'm stunned. You're a blinding flash and a deafening report. But I've got to do a flit, Gorgeous. So clear—"

"Wait a minute—you *can't* go yet! I've got questions to ask you about these new networks and things. How do I handle them?"

"Sorry—you've got to develop your own techniques. You know that already."

"In a way. I thought maybe, though, I could wheedle you into helping me a little. I should have known better—but tell me, all Lensmen don't have minds like this, do they?"

"I'll say they don't. They're all like yours was before, but not as good. Except the other L2's, of course—Dad, Worsel, Tregonsee, and Nadreck. Theirs are more or less like yours is now; but you've got a lot of stuff that they haven't."

"Huh?" she demanded. "Such as?"

"'Way down—there." He showed her. "You worked all of that area yourself. I only showed you how, without getting in too close."

"Why? Oh, I see—you would. Life force. I would have lots of that, of course." She did not blush, but Kid did.

"Life force" was a pitifully inadequate term indeed for that which Civilization's only Lensman-mother had in such measure, but they both knew what it was. Kit ducked.

"You can always tell all about a Lensman by looking at his Lens; it's an absolute diagram of his whole mind. You've studied Dad's, of course."

"Yes. Three times as big as the ordinary ones—or mine—and much finer and brighter. But *mine* isn't, Kit?"

"It *wasn't*, you mean. Put it on and look at it now."

She opened a drawer, and even before she could snap the bracelet around her wrist, her eyes and mouth became three round O's of astonishment. She had never seen that Lens before, or anything like it. It was three times as big as hers, seven times as fine and as intricate, and ten times as bright.

"Why, this isn't mine!" she gasped. "But this is where I put—"

"Sneeze, Gorgeous," Kit advised. "Cobwebs. It lit up, didn't it? You aren't thinking a lick. Your mind changed, so your Lens had to. See?"

"I see." Clarrissa looked deep into her son's eyes, her face again paling under her make-up. "Now *I'm* going to get personal, Kit. Will you let me look at *your* Lens? You never seem to wear it—I haven't seen it since you graduated."

"Sure. Why not?" He reached into a pocket. "I take after you, that way; neither of us gets any kick out of throwing his weight around."

His Lens flamed upon his wrist. It was larger in diameter than Clarrissa's, and thicker. Its texture was finer; its colors were brighter, harsher, and seemed, somehow, more *solid*. Both studied both Lenses for a moment, then Kit seized his mother's hand, brought their wrists together, and stared.

"That's it," he breathed. "That's it—That's IT, just as sure as Klono has got teeth and claws."

"What's it? What do you see?" she demanded.

"I see how and why I got the way I am—and if the kids had Lenses theirs would be the same. Remember Dad's? Look at your dominants—notice that every one of them is duplicated in mine. Blank them out of mine, and see what you've got left—pure Kimball Kinnison, with just enough extras thrown in to make me an individual instead of a carbon copy.

Hm-m-m credits to millos this is what comes of having Lensmen on both sides of the family. No wonder we're freaks! Don't know whether I'm in favor of it or not—I don't think that they should produce any more Lady Lensmen, do you? Maybe that's why they never did."

"Don't try to be funny," she reproved; but her dimples were again in evidence. "If it would result in more people like you and your sisters, I would be very much in favor of it; but, some way or other, I doubt it. I know that you're squirming to go, so I won't hold you any longer. What you just found out about Lenses is fascinating. For the rest of it . . . well . . . thanks, son, and clear ether."

"Clear ether, Mother. This is the worst part of being together, leaving so quick. I'll see you again, though, soon and often. If you get stuck, yell, and one of the kids or I—or all of us—will be with you in a split second."

He gave her a quick, hard hug; kissed her enthusiastically, and left. He did not tell her, and she never did find out, that his "discovery" of one of the secrets of the Lens was made to keep her from asking questions which he could not answer.

The Red Lensman was afraid that she would not have time to put her new mind in order before reaching Lyrane II; but, being naturally a good housekeeper, she did. More, so rapidly and easily did her mind now work, she had time to review and to analyze every phase of her previous activities upon that planet and to lay out in broad her first lines of action. She wouldn't put on the screws at first, she decided. She would let them think that she didn't have any more jets than before. Helen was nice, but a good many of the others, especially that airport manager, were simply quadruply-distilled vixens. She'd take it easy at first, but she'd be very sure that she didn't get into any such jams as last time.

She coasted down through Lyrane's stratosphere and poised high above the city she remembered so well.

"Helen of Lyrane!" she sent out a sharp, clear thought. "That is not your name, I know, but we did not learn any other—"

She broke off, every nerve taut. Was that, or was it not, Helen's thought; cut off, wiped out by a guardian block before it could take shape?

"Who are you, stranger, and what do you want?" the thought came, almost instantly, from a person seated at the desk of the Chief Executive of the planet.

Clarrissa glanced at the sender and thought that she recognized the face. Her new channels functioned instantaneously; she remembered every detail.

"Lensman Clarrissa, formerly of Sol III, Unattached. I remember you, Ladora, although you were only a child when I was here. Do you remember me?"

"Yes. I repeat, what do you want?" The memory did not decrease Ladora's hostility.

"I would like to speak to the former Elder Person, if I may."

"You may not. It is no longer with us. Leave at once, or we will shoot you down."

"Think again, Ladora." Clarrissa held her tone even and calm. "Surely your memory is not so short that you have forgotten the *Dauntless* and its capabilities."

"I remember. You may take up with me whatever it is that you wish to discuss with my predecessor Elder Person."

"You are familiar with the Boskonian Invasion of years ago. It is suspected that they are planning new and Galaxy-wide outrages, and that this planet is in some way involved. I have come here to investigate the situation."

"We will conduct our own investigations," Ladora declared, curtly. We insist that you and all other foreigners stay away from this planet."

"*You* investigate a Galactic condition?" In spite of herself, Clarrissa almost let the connotations of that question become perceptible. "If you give me permission, I will land alone. If you do not, I shall call the *Dauntless* and we will land in force. Take your choice."

"Land alone, then, if you must land," Ladora yielded, seethingly. "Land at our City Airport."

"Under those guns? No, thanks; I am neither invulnerable nor immortal. I land where I please."

She landed. During her previous visit she had had a hard enough time getting any help from these pigheaded matriarchs, but this time she encountered a nonco-operation so utterly fanatical that it put her completely at a loss. None of them tried to harm her in any way; but not one of them would have anything to do with her. Every thought, even the friendliest, was stopped by a full-coverage block; no acknowledgment, even, was ever made.

"I can crack those blocks easily enough, if I want to," she declared, one bad evening, to her mirror, "And if they keep this up very much longer, by Klono's emerald-filled gizzard, I *will!*"

XIV.

When Kimball Kinnison received his son's call he was in Ultra Prime, the Patrol's stupendous Klovian base, about to enter his ship. He stopped for a moment; practically in mid-stride. While nothing was to be read in his expression or in his eyes, the lieutenant to whom he had been talking had been an interested, if completely uninformed, witness to many such Lensed conferences, and knew that they were usually important. He was, therefore, not surprised when the Lensman turned around and headed for an exit.

"Put her back, please. I won't be going out for a while, after all," Kinnison explained, briefly. "Don't know exactly how long."

A fast flitter took him to the hundred-story pile of stainless steel and glass which was the Co-ordinator's office. He strode along a corridor, through an unmarked door.

"Hi, Phyllis—the boss in?"

"Good morning, Chief. Yes, sir . . . no, I mean . . ." His startled secretary touched a button and a door opened; the door of his private office.

"Hi, Kim—back so soon?" Vice Co-ordinator Maitland also showed surprise as he got up from the massive desk and shook hands cordially. "Good! Taking over?"

"Emphatically no. Hardly started yet. Just dropped in to use your plate, if you've got a free high-power wave. QX?"

"Certainly. If not, you can free one fast enough."

"Communications." Kinnison touched a stud. "Will you please get me Thrale? Library One; Principal Librarian Nadine Ernley. Plate to plate."

This request was surprising enough to the informed. Since the Co-ordinator practically never dealt personally with anyone except Lensmen, and usually Unattached Lensmen at that, it was a rare event indeed for him to use any ordinary channels of communication. And as the linkage was completed, subdued murmurs and sundry squeals gave evidence that intense excitement prevailed at the other end of the line.

"Mrs. Ernley will be on in one moment, sir." The operator's business was done. Her crisp, clear-cut voice ceased, but the background noise increased markedly.

"Sh . . sh . . . sh! It's the Gray Lensman, himself!" Everywhere upon Klovia, Tellus, and Thrale, and in many localities of many other planets, the words "Gray Lensman", without surname, had only one meaning.

"Not the *Gray Lensman!*"

"It can't be!"

"It *is*, really . . . I know him . . . I actually *met* him once!"

"Let *me* look . . . just a peek!"

"Sh . . .sh! He'll *hear* you!"

"Switch on the vision. If we've got a moment, let's get acquainted," Kinnison suggested, and upon his plate there burst into view a bevy of excitedly embarrassed blondes, brunettes, and redheads. "Hi, Madge! Sorry that I don't know the rest of you, but I'll make it a point to get acquainted—before long, I think. Don't go away." The principal librarian was coming on the run. "You're all in on this. Hi, Nadine! Long time no see. Remember that bunch of squirrel food you rounded up for me?"

"I remember, sir." What a question! As though Nadine Ernley, nee Hostetter, could ever forget her share in that famous meeting of the fifty-three greatest—and least stable—scientific minds of all Civilization. "I'm sorry that I was out in the stacks when you called."

"QX—we all have to work sometimes, I suppose. What I'm calling about is that I've got a mighty big job for you and those smart girls of yours. Something like that other one, only a lot more so. I want all the information you can dig up about a planet named Kalonia, just as fast as you can possibly get it. What makes it extra tough is that I have never even

heard of the planet itself and don't know of anyone who has. There may be a million other names for it, on a million other planets, but we don't know any of them. Here's all I know." He summarized; concluding: "If you can get it for me in less than four point nine five G-P days from now I'll bring you, Nadine, a Manarkan star-drop: and you can have each of your girls go down to Brenleer's and pick out a wrist watch or whatever she likes, and I'll have it engraved to her 'In appreciation, Kimball Kinnison'. This job is important—my son Kit has bet me ten millos that we can't do it that fast."

"Ten *millos!*" Four or five of the girls gasped as one.

"Fact," he assured them, gravely. "So whenever you get the dope, tell Communications . . . no, you listen while I tell them myself. Communications, all along the line, come in!" They came. "I expect one of these librarians to call me, plate to plate, within the next few days. When she does, no matter what time of the day or night it is, and no matter what I or anyone else happen to be doing, that call will have the right-of-way over any other business in the Universe. Cut!" The plates went dead and in Library One:

"But he was joking, surely!"

"Ten *millos*—one cento—and a star-drop—why, there aren't more than a dozen of them on all Thrale!"

"Wrist watches—or something—from the Gray Lensman!"

"Be quiet, everybody!" Madge exclaimed. "I see now. That's the way Nadize got *her* watch, that she always brags about so insufferably and that makes everybody's eyes turn green. But I don't understand that silly ten-millo bet . . . do you, Nadine?"

"I think so. He does the nicest things—things that nobody else would think of. You have seen Red Lensman's Chit, in Brenleer's." This was a statement, not a question. They all had, with what emotions they all knew. "How would you like to have that one-cento piece, in a thousand-credit frame, here in our main hall, with the legend 'won from Christopher Kinnison for Kimball Kinnison by . . .' and our names? He's got something like that in mind, I'm sure."

The ensuing clamor indicated that they liked the idea.

"He knew we would; and he knew that doing it this way would make us dig like we never dug before. He'll give us the watches and things anyway, of course, but we won't get that one-cento piece unless we win it. So let's get to work. Take everything out of the machines, finished or not. Madge, you might start by interviewing Lanion and the other—no, I'd better do that myself, since you are more familiar with the encyclopedia than I am. Run the whole English block, starting with K, and follow up any leads, however slight, that you can find. Betty, you can analyze for synonyms, starting with the Thralian equivalent of Kalonia and spreading out to the other Boskonian planets. Put half a dozen

techs on it, with transformers. Frances, you can study Prellin and Bronseca. Joan, Leona, Edna—Jalte, Helmuth, and Crowninshield. Beth, as our best linguist, you can do us the most good by sensitizing a tech to the sound of Kalonia in each of all the languages you know or that the rest of us can find, and running and rerunning all the transcripts we have of Boskonian meetings. How many of us are left? Not enough—we'll have to spread ourselves thin on this list of Boskonian planets."

Thus Principal Librarian Ernley organized a search beside which the proverbial one of finding a needle in a haystack would have been as simple as locating a football in a bushel basket. And she and her girls worked. *How* they worked! And thus, in four days and three hours, Kinnison's top-priority person-to-person call came through. Kalonia was no longer a planet of mystery.

"Fine work, girls! Put it on a tape and I'll pick it up."

He then left Klovia—precipitately. Since Kit was not within rendezvous distance, he instructed his son—after giving him the high points of what he had learned—to forward one one-cento piece to Brenleer of Thrale, personal delivery. He told Brenleer what to do with it upon arrival. He landed. He bestowed the star-drop; one of Cartiff's collection of fine gems. He met the girls, and gave each one her self-chosen reward. He departed.

Out in open space, he ran the tape once—Second Stage Lensmen do not forget any detail of anything they have ever learned—and sat still, scowling blackly. It was no wonder that Kalonia had remained unknown to Civilization for over twenty years. There was a lot of information on that tape—and all of it stunk—but it had been as-

sembled, one unimportant bit at a time, from the more than eight hundred million cards of Thrale's Boskonian Archives; and all of the really significant items had been found on vocal transcriptions which had never before been played.

Civilization in general had assumed that Thrale had housed the top echelons of the Boskonian Empire, and that the continuing inimical activity had been due solely to momentum. Kinnison and his friends had had their doubts, but they had not been able to find any iota of evidence that any higher authority had ever issued any orders to Thrale. The Gray Lensman now knew, however, that Thrale had never been the top. Nor was Kalonia. The information on this tape, by its paucity, its brevity, its incidental and casual nature, made that fact startlingly clear. Thrale and Kalonia were *equals*. Neither gave the other any orders—in fact, they had surprisingly little to do with each other. While Thrale formerly directed the activities of a half-million or so planets—and Kalonia apparently still did much the same—their fields of action had not overlapped at any point.

His conquest of Thrale, hailed so widely as such a triumph, had got him precisely nowhere in the solution of the real problem. It might be possible for him to conquer Kalonia in a similar fashion, but what would it get him? Nothing. There would be no more leads upward from Kalonia than there had been from Thrale. How in all of Noshabkeming's variegated and iridescent hells was he going to work this out?

A complete analysis revealed only one possible method of procedure. In one of the transcriptions—made twenty-one years ago and unsealed for the first time by Beth, the librarian-linguist—one of the speakers had mentioned casually that the new Kalonian Lensmen seemed to be doing a good job, and a couple of the others had agreed with him. That was all. It might, however, be enough; since it made it highly probable that Eddie's Lensman was in a fact a Kalonian, and since even a Black Lensman would certainly know where he got his Lens. At the thought of trying to visit the Boskonian equivalent of Arisia he flinched, but only momentarily. Invasion, or even physical approach, would, of course, be impossible; but any planet, even Arisia itself, could be destroyed. If it could be found, that planet would be destroyed. He *had* to find it—that was probably what Mentor had been wanting him to do all the time! But how?

In his various previous enterprises against Boskonia he had been a gentleman of leisure, a dockwalloper, a meteor miner, and many other things. None of his already established aliases would fit on Kalonia; and besides, it was very poor technique to repeat himself, especially at this high level of opposition. To warrant appearance on Kalonia at all, he would have to be an operator of some kind—not too small, but not big enough so that an adequate background could

not be synthesized in a hurry. A zwilnik—an actual drug-runner with a really worth-while cargo—would be the best bet.

His course of action decided, the Gray Lensman started making calls. He first called Kit, with whom he held a long conversation. He called the captain of his battleship-yacht, the *Dauntless*, and gave him many and explicit orders. He called Vice Co-ordinator Maitland, and various other Unattached Lensmen who had plenty of weight in Narcotics, Public Relations, Criminal Investigation, Navigation, Homocide, and many other apparently totally unrelated establishments of the Galactic Patrol. Finally, after ten solid hours of mind-wracking labor, he ate a tremendous meal and told Clarrissa—he called her last of all—that he was going to go to bed and sleep for one whole G-P week.

Thus it was that the name of Bradlow Thyron began to obtrude itself above the threshold of Galactic consciousness. For seven or eight years that name had been below the middle of the Patrol's long, black list of the wanted; now it was well up toward the top. That notorious zwilnik and his villainous crew had been chased from one side of the First Galaxy to the other. For a few months it had been supposed that they had been blown out of the ether. Now, however, it was known definitely that he was operating in the Second Galaxy, and he and every one of his cutthroat gang—fiends who had blasted thousands of lives with the noxious wares—were wanted for piracy, drug-mongering, and first-degree murder. From the Patrol's standpoint, the hunting was very poor. G-P planetographers have charted only a small percentage of the planets of the Second Galaxy; and only a few of those are peopled by the adherents of Civilization.

Therefore it required some time, but finally there came the message for which Kinnison was so impatiently waiting. A Boskonian pretty-big-shot drug-master named Harkleroy, on the planet Phlestyn II, city, Nelto, co-ordinates so-and-so, fitted his specifications to a "T": a middle-sized operator neither too close to nor too far away from Kalonia. And Kinnison, having long since learned the lingua franca of the region from a local meteor miner, was ready to act.

First, he made sure that the mighty *Dauntless* would be where he wanted her when he needed her. Then, seated at his speedster's communicator, he put through regular channels a call to the Boskonian.

"Harkleroy? I've got a proposition you'll be interested in. Where and when do you want to see me?"

"What makes you think I want to see you at all?" a voice snarled, and the plate showed a gross, vicious face. "Who are you, scum?"

"Who I am is nobody's business—and if you don't clamp a baffle on that mouth of yours I'll come down there and shove a glop-skinner's glove so far down your throat you can sit on it."

At the first defiant word the

zwilnik began visibly to swell; but in a matter of seconds he recognized Bradlow Thyron, and Kinnison knew that he did. That pirate could, and would be expected to, talk back to anybody.

"I didn't recognize you at first." Harkleroy almost apologized. "We might do some business, at that. What have you got?"

"Cocaine, heroin, bentlam, hashish, nitrolabe — most anything a warm-blooded oxygen-breather would want. The prize package, though, is two kilograms of clear-quill thionite."

"Thionite—two kilograms!" The Phlestan's eyes gleamed. "Where and how did you get it?"

"I asked the Lensman on Trenco to make it for me, special, and he did."

"So you won't talk, huh?" Kinnison could see Harkleroy's brain work. Thyron could be made to talk, later. "We can maybe do business at that. Come down here right away."

"I'll do that, but listen!" and the Lensman's eyes burned into the zwilnik's. "I know what you're figuring on, and I'm telling you right now not to try it if you want to keep on living. You know that this ain't the first planet I ever landed on, and if you've got a brain you know that a lot of guys smarter than you are have tried monkey business on me—and I'm still here. So watch your step!"

The Lensman landed, and made his way to Harkleroy's inner office in what seemed to be an ordinary enough, if somewhat oversize, suit of light space-armor. But it was no more ordinary than it was light. It was a powerhouse, built of dureum a quarter of an inch thick. Kinnison was not walking in it; he was merely the engineer of a battery of two-thousand-horsepower motors. Unaided, he could not have lifted one leg of that armor off the ground.

As he had expected, everyone he encountered wore a thought-screen; nor was he surprised at being halted by a blaring loud-speaker in the hall, since the zwilnik's search-beams were being stopped four feet away from his armor.

"Halt! Cut your screens or we'll blast you where you stand!"

"Yeah? Act your age, Harkleroy. I told you I had a lot of stuff up my sleeve besides my arm, and I meant it. Either I come as I am or I flit somewhere else, to do business with somebody who wants this stuff bad enough to act like half a man. 'Smatter—afraid you ain't got blasters enough in there to handle me?"

This taunt bit deep, and the visitor was allowed to proceed. As he entered the private office, however, he saw that Harkleroy's hand was poised near a switch, whose closing would signal a score or more of concealed gunners to burn him down. They supposed that the stuff was either on his person or in his speedster just outside. Time was short.

"I abase myself—that's the formula you insist on, ain't it?" Kinni-

son sneered, without bending his head a millimeter.

Harkelroy's finger touched the stud.

"*Dauntless!* Come down!" Kinnison snapped out the order.

Hand, stud, and a part of the desk disappeared in the flare of Kinnison's beam. Wall-ports opened; projectors and machine rifles erupted vibratory and solid destruction. Kinnison leaped toward the desk; the attack slowing down and stopping as he neared and seized the big shot. One fierce, short blast reduced the thought-screen generator to blobs of fused metal. Harkleroy screamed to his gunners to resume fire, but before bullet or beam took the zwilnik's life, Kinnison learned what he most wanted to know.

The ape did know something about Black Lensmen. He didn't know where the Lenses came from, but he did know how the men were chosen. More, he knew a Lensman personally—one Melasnikov, who had his office in Cadsil, on Kalonia III itself.

Kinnison turned and ran—the alarm had been given and they were bringing up stuff too heavy for even his armor to handle. But the *Dauntless* was landing already; smashing to rubble five city blocks in the process. She settled; and as the dureum-clad Gray Lensman began to fight his way out of Harkleroy's fortress, Major Peter van-Buskirk and a full battalion of Valerians, armed with space-axes and semiportables, began to hew and to blast their way in.

TO BE CONTINUED.

"VENUS EQUILATERAL"

The series of novelettes George O. Smith did for Astounding concerning the problems and adventures of Don Channing and Co. in and about Venus Equilateral has been collected into book form. One new novelette, never published in magazine form, has been added to the book—"Mad Holiday"—in which snow falls by the ton in Venus Equilateral, and Santa Claus, with Reindeer, arrives for the celebration. There's also an introduction by John W. Campbell, Jr.

The book has been brought out by Prime Press, Box 2019, Philadelphia 3, Penn. Price not fixed at this writing, but either $2.50 or $3.00.

BRASS TACKS

We're even sorrier—but Unknown *remains unknown. The paper selection is as bad as ever.*

Gentlemen:

I have noticed lately that quite a few of your readers mentioned in their letters to the editors of your various magazines that they understood you were going to start publishing the *Unknown* magazine again. Since there were no footnotes confirming or denying it, I thought I would write to you whether there is anything to this rumor.

I used to read this magazine and was very sorry to see it go on account of the paper shortage, and I do hope that you will be able to publish it again.—E. Block, 1573 York Avenue, New York 28, N.Y.

Dr. Smith! Coming right up!

Dear Mr. Campbell:

With the July Astounding, it becomes evident that the heralded postwar renaissance in science fiction is at last in sight—if not already upon us. And it is not merely a return to the "good old days," for science fiction, like everything else, has changed. For the better, I might add. The space pirates are gone—or going—and rest unlamented.

For the Lab, "Fury" takes an easy first this time. The cumulative effect of O'Donnell's novel wasn't felt until this final part; whereupon I went back and reread the entire story. It strikes me as being your best serial in a long, long time—and serials are your strong point. "It wasn't atomic power that destroyed Earth. *It was a pattern of thought.*" That bears repeating today.

Second place will have to be shared by Williamson and Anderson, for "With Folded Hands" and "Logic" respectively. Both were very good. It's interesting to note how much Williamson has changed. His characterization is far better

than it used to be, and his stories are more thoughtfully presented. However, there is something lacking now that he had then—a certain flair for the vivid and the dramatic. Just for the record, I think that "Darker Than You Think," in *Unknown,* was his finest story.

Edward Grendon's "The Figure," despite an element of obviousness, was good enough so that I'm sorry to have to place it fourth.

The enlarged Brass Tacks was sheer bliss—I hope it continues, even if it requires a reversion to the small type of yesteryear. The letter by Margaret McIntyre was very interesting, as were her nominations for Astounding's best. You'll go a far piece before you find two stories that will top "Judgment Night" and "Final Blackout." As for Dr. Smith, his work has a charm and realism that lifts it far out of the usual run of space operas. I like him, and hope he returns soon. I'd also love to encounter a serial by de Camp. Or by Van Vogt, if of the haunting quality that made "Slan" so memorable. Incidentally, what sort of a book is de Camp working on?—Chad Oliver, c/o Mrs. Allen Baker, Kerrville, Texas.

Hey—those aren't rivets! They're portholes!

Dear Mr. Campbell,

I've been reading Astounding for five or six years and am quite a fan, though the word and idea is distasteful to me. Your magazine has improved in format and layout but the stories, though very smoothly written lack the abstract qualities of vitality and sincerity. Mr. O'Donnell's, "Fury," for example, certainly does not compare with "Clash By Night," even with more pretentious poetical quotations. I, of course, judge from only two of three parts, and the conclusion may reverse my opinion. A. E. van Vogt's "Centaurus II," is very well written, but when I think of "The Weapon Shop," or "Slan!"—However there isn't another science-fiction magazine I can look in the face, regardless of its size.

I'm a student of English at Indiana University, and I write quite a bit of fiction for my writing courses. I get all kinds of reactions from my professors when I write science-fiction. One of my professors, who publishes poetry regularly did not like an atomic war story "Mainly because of my reluctance to treat the atomic bomb in the pseudo-scientific manner of the science story magazine." Needless to say, we went around and around concerning "pseudo" and his quotations around "science," but I respected his sincerity at the importance of the atomic bomb.

The atomic bomb isn't taken seriously by many nonscience students. This is evident in speeches and debates on Universal Military Training. People still define the future in terms of the past. We need a Hari Selden!

Now to rate the stories in the June issue.

1. "Centaurus II"—It would seem Van Vogt would have more up his writing sleeve than this.
2. "Fury," by O'Donnell. So far, two well-plotted but somewhat dull parts.
3. "The Model Shop," by Jones. Very interesting and a good short story.
4. "Letter To Ellen," by Chan Davis. This story sparkled but went out quickly.
5. "Errand Boy," by Tenn. I'm tired of these, even if I only read one a year. Good implied glance into future.

The illustrations continue to improve. Now if we could just eliminate that riveted spacer on the title page!

A. E. Van Vogt's "World of A" got me in trouble in Logic class, especially the Similarity Equations. what Logician was the champion of null-class?—John Woods, 285 N. Grant St., Martinsville, Indiana.

It was reprinted—in "Adventures in Time and Space," the Random House anthology.

Dear Sir:

I have just finished a story that was printed in Astounding Science Fiction some years ago, and I must say that I was so impressed with it that I could not resist the temptation to send you a request that it be reprinted. It is "Farewell to the Master," by Harry Bates. I'm sure you recall that one! I know it is against your policy to print stories that have appeared in print before, but in this case I think an exception might well be made. I'm sure my fellow readers of Astounding will thank you for it.

—Seymour B. Levinson, 152 Little Hall, Princeton University, Princeton, New Jersey.

Don't read it—write it!

Dear Mr. Campbell:

While one cannot speak too highly of your periodical, and while it far excels any other science-fiction magazine in respect to technical quality and richness of intriguing ideas, there does appear an occasional blemish. Chiefly, this happens when one of your writers becomes involved in some medical notion. It tends to discourage otherwise admiring readers such as I.

For example, L. R. Hubbard, on p. 121 of your September issue, has strung together some startling ways of treating a badly injured man: "Use anti-reticular serum. Use estrone and testostrone. Thyroxin. Amino acids. Use penicillin. Make him live." And later: "Inject them intramuscularly. The body will maintain a proper balance. Testostrone won't work all alone. It hardly works at all. And thyroxin is needed. Use ten testo-

strone to one estrone and three grains thyroxin per day."

It is not to be objected that Hubbard has some new ideas here; that would be excellent had he not got them pretty badly garbled. The ideas are not particularly new: we have a great deal of evidence to show activity of testosterone—NB spelling—in the reconstruction of protein as after injury. But if your man were really informed, he would have made a more dramatic use of adrenal cortical hormone—rather than thyroxin, for example, which is a poor material to work with at best but lethal at three grains a day. If he really meant to use testosterone antagonists such as estrone, he would have done better to catch up these last 10-12 years and suggested estradiol. The whole effect of this text is to bewilder and discourage; it is a let-down relative to the rest of the story.

What you need, Mr. Campbell, is a little more criticism from the medical side *prior* to publication. Since I am bound to read your stuff anyway, I should be happy to help out to such extent as time affords. In return I should ask a salary of about one dollar per annum and release from any possible legal liability.

For the past 7+ years—less war service—I have been engaged on the staff of the largest hormone-manufacturing concern in this country. I really could tell your boys where they are off.—Marvin Weinberg, M.D., 230 Central Park West, New York City.

It was stated that Alaric could learn logic, but it was harder for him. His network thinking might have read on a page-as-a-concept basis, rather than phrase-at-a-time as we do.

Dear Mr. Campbell:

I have just finished the August issue and am impatient for the rest of Hubbard's serial; it has a note of optimism new to these days of race suicide. Also, it is different in that it develops the characters more than the bombs. However, I am no different from the rest of the fans—as I've seen them in Brass Tacks—in that I am tired of a steady diet of war and desolation—only an occasionl conflict ought to be enough to keep us on our toes.

"Propagandist" made a good second, if too mushy on the dog-master relationship. The rest, in descending order, are "Insomnia Inc.," "The Person From Porlock"—a good idea but under-developed—and "Rat Race." The last was well written enough but trivial. The articles, as usual, were good, especially "Calendar for Mars": so long as we are talking up colonizing the planets, why not be accurate and specific?

My chief reason for writing, however, is something unclear about the logic of Poul Anderson's "Logic" (ASF, July) that has bothered me since I read the story. I liked it well enough; but, if Alaric's thought processes were so different from "normal" that he could not readily understand, say, speech, I maintain that he could not understand his

voluminous reading or any other form of human communication above the level of gestures or pictures. Not only because writing is visual speech, but because all expressions of human meaning are abstractions, abstracted according to the particular rules of human mentality. Not even, or should it be especially, the theoretical physicist claims any more meaning for his equations than that they are ways of looking at things—abstractions again—he never says that they represent what actually is going on. We understand him, if we are well versed and able enough, because we play the game with the same rules. For each way of viewing a process, there are many alternatives; the one generally used is the one which to us is simplest, not necessarily the most accurate *objective*—something we'll probably never reach—description. All this talk about mathematics and physics is entered primarily because Alaric was described as a mathematician and engineer *par excellance*. If Alaric couldn't understand speech, he couldn't understand writing because it is the same thing—straight line thought with no meaning to his network type mind. The only hope for him would be the development of his own viewpoints, which in turn would mean little to us—he is in the same situation as the cave man, with a good mind, but no idea of how to use it nor anyone to teach him. Alaric and his kind would have to develop their own civilization, slowly, uncertainly. We could help them with material things, but anything beyond that would be up to them. Alaric is an extreme type, but possibly there might be people today like him, not necessarily stupid, but enough divergent to be at a disadvantage and not smart enough to find their own way. A possible network thinker, for instance, could sense something of the interdependence of factors, but would not know how to pin it down, both because he would have had no help in that direction and because most of his training would have been toward straight line thinking. Yet his straight line thought would be somewhat incoherent and trivial because of his network basis. The type of communication proper for network thinkers interests me because speech and all of its derivatives enforce straight line presentation by their very nature. (This excepts telepathy, which would be perfect.)

There are two other points of contention so far as I am concerned. Unless the statement be emphasized that Alaric's particular mentality kept him from seeing the practical aspect, I cannot understand that his network mind be necessarily of the absent-minded professor type. Practicality has no observable relationship to intelligence of the ordinary type with the exception that the more intelligent people are more successful at it when so inclined. Also I cannot see why a favorable mutation should involve a corresponding loss of any more than its very nature excludes. Thus the eagle-eyed boy mentioned necessarily no longer has the doubtful

benefit of inferior sight; or, when men become erect, they could no longer do some of the things done by quadrupeds, well, but the compensations of erect posture more than counterbalanced that. In a population with as unstable a genetic constitution as the people of "Logic," with a high number of mutations, the number of unfavorable ones should naturally exceed the good, and it is highly probable that one individual would receive more than one, some perhaps good, some bad. But unless any one gene have both favorable and unfavorable effects, which would have to be averaged before the value of the gene be assayed, I cannot see any more than an accidental connection between what would be a step forward and a step back. The law of probability gives advantages to only a few, but who ever wrote science-fiction about really average people?

I do not expect you to print this necessarily, but I think that the problem is basically one of semantics which ought to be cleared up. One of the biggest pitfalls of any type of fantasy is taking for granted commonplace things which, under changed conditions, are not necessarily commonplace. Of course an author cannot estimate everything accurately, if he could he would be both brilliant and incomprehensible, but the factors involved in the basic plan of the story should be as clear cut as possible.

Incidentally, I rate "Logic" first in that issue, for both the writing and the idea were good. After that came the termination of "Fury"—couldn't we have a sequel about peaceful Venus before we have another war with Sam?—"With Folded Hands"—rather morbid—and "The Figure." How about some articles on psychology, zoology, geology, or something else besides physics occasionally?

I see that the perennial fight over the formats has come back. I prefer the present small size; I save magazines, and the small ones are less likely to be torn and are easier to handle. When more paper comes, make ASF thicker, not larger. Weekly publication is something I hadn't thought of till I saw the idea in Brass Tacks; why not if the present standards don't suffer?

Unknown Worlds is an unknown quantity to me since I got only a few copies before it went out of publication. However, I like the copies I have, and, when more paper comes, I'd like a chance to get acquainted.—William R. Boniface, 4249 Shenandoah Avenue, St. Louis 10, Missouri.

Zeno's Paradox starts with two velocities. Therefore, when the distance is subdivided indefinitely, the elapsed time must also be subdivided, yielding, in the end, $\int \frac{ds}{dt}$. *Only the Greeks didn't have integral calculus. Incidentally, "Slan" is available in a somewhat modernized book form.*

Dear John:

It may interest you to know that I have just finished rereading

"Slan," and if my memory fails me not, I enjoyed it more than the first time. Of course, during the reading I had to discount certain things which when the story was written were still in the realm of Science Fiction—Atomic Power, for instance. The only annoying parts were those built around Cross' super gadgets, which in my mind is cheap science fiction. These, however, I blithely ignored, not permitting such trivial matters to detract from the pleasure of the story. It all boils down to this: "Slan" is still a *great* story.

I'm anxiously awaiting the September issue to see this cover you've been bragging about. Even allowing for your four-color process, it had better be great after the big build-up. The present interior art work is about the best I've seen in it since I've been reading Astounding, except possibly for a few odd issues I have. In the August issue I find the stories rather hard to rate with the exception of "The End is Not Yet," which definitely takes first place. I'd like to rate the rest for the sake of the Lab, but I so enjoyed them all I fear any attempt to do so would be inaccurate. Personally, I'd put them all in second place from the standpoint of a few hours well-spent.

Incidentally, I noticed a point in Science Discussions in the October 1940 issue I wish you'd clear up for me. Your blurb for one of the letters is: "Another version of 'Zeno's Paradox'. Simple? It took two thousand years to develop the mathematics to answer it!" The question is this: *what is the answer?* —Walt Kessel, 1207 E. Henry Street, Savannah, Georgia.

In other words, Hank Kuttner's good—but he's not all the good authors!

Dear Mr. Campbell:

I note with interest the recent letter from a reader which compliments Astounding's new author, William Tenn. Unhappily, however, the letter ends with the comment that Tenn is probably just another pseudonym for Henry Kuttner—and that, as the English professor said, "ain't givin' credit where it are due."

For the records, then, let me assure your readers, as Tenn's literary agent, that William Tenn is not Henry Kuttner but William Tenn, and is so much William Tenn that he even has three pseudonyms of his own. The excellence of his stories in this magazine and others, by the way, may be due in part to the fact that he is the protegé of another of our clients, one Theodore Sturgeon. —Scott Meredith.

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